ROYAL GLOBAL UNIVERSITY
GUWAHATI

Royal School of Design
(RSD)

Department of Product Design

Course Structure & Syllabus
(Based on National Education Policy 2020)

For Undergraduate Programme

B.Des. in Product Design

(4 Years Single Major)

WEF AY 2023-24

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1. Preamble

The National Education Policy (NEP) 2020 conceives a new vision for India's higher education system. It recognizes that higher education plays an extremely important role in promoting equity, human as well as societal well-being and in developing India as envisioned in its Constitution. It is desired that higher education will significantly contribute towards sustainable livelihoods and economic development of the nation as India moves towards becoming a knowledge economy and society.

If we focus on the 21st century requirements, the higher education framework of the nation must aim to develop good, thoughtful, well-rounded, and creative individuals and must enable an individual to study one or more specialized areas of interest at a deep level, and also develop character, ethical and Constitutional values, intellectual curiosity, scientific temper, creativity, spirit of service, and twenty-first-century capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as professional, technical, and vocational subjects. A quality higher education should be capable enough to enable personal accomplishment and enlightenment, constructive public engagement, and productive contribution to the society. Overall, it should focus on preparing students for more meaningful and satisfying lives and work roles and enable economic independence.

Towards the attainment of holistic and multidisciplinary education, the flexible curricula of the University will include credit-based courses, projects in the areas of community engagement and service, environmental education, and value-based education. As part of holistic education, students will also be provided with opportunities for internships with local industries, businesses, artists, crafts persons, and so on, as well as research internships with faculty and researchers at the University, so that students may actively engage with the practical aspects of their learning and thereby improve their employability.

The undergraduate curriculums are diverse and have varied subjects to be covered to meet the needs of the programs. As per the recommendations from the UGC, introduction of courses related to Indian Knowledge System (IKS) is being incorporated in the curriculum structure which encompasses all of the systematized disciplines of Knowledge which were developed to a high degree of sophistication in India from ancient times and all of the traditions and practises that the various communities of India—including the tribal communities—have evolved, refined and preserved over generations, like for example Vedic Mathematics, Vedangas, Indian Astronomy, Fine Arts, Metallurgy, etc.

At RGU, we are committed that at the societal level, higher education will enable each student to develop themselves to be an enlightened, socially conscious, knowledgeable, and skilled citizen who can find and implement robust solutions to its own problems. For the students at the University, Higher education is expected to form the basis for knowledge creation and innovation thereby contributing to a more vibrant, socially engaged, cooperative community leading towards a happier, cohesive, cultured, productive, innovative, progressive, and prosperous nation."

2. Introduction

The National Education Policy (NEP) 2020 clearly indicates that higher education plays an extremely important role in promoting human as well as societal well-being in India. As envisioned in the 21st-century requirements, quality higher education must aim to develop good, thoughtful, well-rounded, and creative individuals. According to the new education policy, assessments of educational approaches in undergraduate education will integrate the humanities and arts with Science, Technology, Engineering and Mathematics (STEM) that will lead to positive learning outcomes. This will lead to develop creativity and innovation, critical thinking and higher-order thinking capacities, problem-solving abilities, teamwork, communication skills, more in-depth learning, and mastery of curricula across fields, increases in social and moral awareness, etc., besides general engagement and enjoyment of learning. and more in-depth learning.

The NEP highlights that the following fundamental principles that have a direct bearing on the curricula would guide the education system at large, viz.

i. Recognizing, identifying, and fostering the unique capabilities of each student to promote her/his holistic development.

ii. Flexibility, so that learners can select their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests.

iii. Multidisciplinary and holistic education across the sciences, social sciences, arts, humanities, and sports for a multidisciplinary world.

iv. Emphasis on conceptual understanding rather than rote learning, critical thinking to encourage logical decision-making and innovation; ethics and human & constitutional values, and life skills such as communication, teamwork, leadership, and resilience.

v. Extensive use of technology in teaching and learning, removing language barriers, increasing access for Divyang students, and educational planning and management.

vi. Respect for diversity and respect for the local context in all curricula, pedagogy, and policy.

vii. Equity and inclusion as the cornerstone of all educational decisions to ensure that all students can thrive in the education system and the institutional environment are responsive to differences to ensure that high-quality education is available for all.

viii. Rootedness and pride in India, and its rich, diverse, ancient, and modern culture, languages, knowledge systems, and traditions.

2.1. Credits in Indian Context:

2.1.1. Choice Based Credit System (CBCS) by UGC

Under the CBCS system, the requirement for awarding a degree or diploma or certificate is prescribed in terms of number of credits to be earned by the students. This framework is being implemented in several universities across States in India. The main highlights of CBCS are as below:

• The CBCS provides flexibility in designing curriculum and assigning credits based on the course content and learning hours.

• The CBCS provides for a system wherein students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.

• CBCS also provides opportunity for vertical mobility to students from a bachelor's degree programme to masters and research degree programmes.

2.2. Definitions:

2.2.1. Academic Credit

An academic credit is a unit by which a course is weighted. It is fixed by the number of hours of instructions offered per week. As per the National Credit Framework;

1 Credit = 30 NOTIONAL CREDIT HOURS (NCH)

Yearly Learning Hours = 1200 Notional Hours (@40 Credits x 30 NCH)

30 Notional Credit Hours		
Lecture/Tutorial	Practicum	Experiential Learning
1 Credit = 15-22 Lecture Hours	10-15 Practicum Hours	0-8 Experiential Learning Hours

2.2.2. Course of Study:

Course of study indicate pursuance of study in Product Design. The Product Design course shall offer Major Courses (Core), Minor Courses, Skill Enhancement Courses (SEC), Value Added Courses (VAC), Ability Enhancement Compulsory Courses (AECCs) and Interdisciplinary courses.

2.2.3. Disciplinary Major:
The major would provide the opportunity for a student to pursue in-depth study of a particular subject in Product Design. Students may be allowed to change major within the broad discipline at the end of the second semester by giving her/him sufficient time to explore interdisciplinary courses during the first year. Advanced-level disciplinary/interdisciplinary courses, a course in research methodology, and a project/dissertation will be conducted in the seventh semester. The final semester will be devoted to seminar presentation, preparation, and submission of project report/dissertation. The project work/dissertation will be on a topic in the disciplinary programme of study or an interdisciplinary topic.

2.2.4. Disciplinary/interdisciplinary minors:
Students will have the option to choose courses from disciplinary/interdisciplinary minors and skill-based courses. Students who take enough courses in a discipline or an interdisciplinary area of study other than the chosen major will qualify for a minor in that discipline or in the chosen interdisciplinary area of study. A student may declare the choice of the minor at the end of the second semester, after exploring various courses.

2.2.5. Courses from Other Disciplines (Interdisciplinary):
All UG students are required to undergo 3 introductory-level courses relating to any of the broad disciplines given below. These courses are intended to broaden the intellectual experience and form part of liberal arts and science education. Students are not allowed to choose or repeat courses already undergone at the higher secondary level (12th class) in the proposed major and minor stream under this category.

i. Natural and Physical Sciences: Students can choose basic courses from disciplines such as Natural Science, for example, Biology, Botany, Zoology, Biotechnology, Biochemistry, Chemistry, Physics, Biophysics, Astronomy and Astrophysics, Earth and Environmental Sciences, etc.

ii. Mathematics, Statistics, and Computer Applications: Courses under this category will facilitate the students to use and apply tools and techniques in their major and minor disciplines. The course may include training in programming software like Python among others and applications software like STATA, SPSS, Tally, etc. Basic courses under this category will be helpful for science and social science in data analysis and the application of quantitative tools.

iii. Library, Information, and Media Sciences: Courses from this category will help the students to understand the recent developments in information and media science (journalism, mass media, and communication)

iv. Commerce and Management: Courses include business management, accountancy, finance, financial institutions, fintech, etc.,

v. Humanities and Social Sciences: The courses relating to Social Sciences, for example, Anthropology, Communication and Media, Economics, History, Linguistics, Political Science, Psychology, Social Work, Sociology, etc. will enable students to understand the individuals and their social behaviour, society, and nation. Students be introduced to survey methodology and available large-scale databases for India. The courses under humanities include, for example, Archaeology, History, Comparative Literature, Arts & Creative expressions, Creative Writing and Literature, language(s), Philosophy, etc., and interdisciplinary courses relating to humanities. The list of Courses can include interdisciplinary subjects such as Cognitive Science, Environmental Science, Gender Studies, Global Environment & Health, International Relations, Political Economy and Development, Sustainable Development, Women's, and Gender Studies, etc. will be useful to understand society.

2.2.6. Ability Enhancement Courses (AEC): Modern Indian Language (MIL) & English language focused on language and communication skills. Students are required to achieve competency in a Modern Indian Language (MIL) and in the English language with special emphasis on language and communication skills. The courses aim at enabling the students to acquire and demonstrate the core linguistic skills, including critical reading and expository and academic writing skills, that help students articulate their arguments and present their thinking clearly and coherently and recognize the importance of language as a mediator of knowledge and identity. They would also enable students to acquaint themselves with the cultural and intellectual heritage of the chosen MIL and English language, as well as to provide a reflective understanding of the structure and complexity of the language/literature related to both the MIL and English language. The courses will also emphasize the development and enhancement of skills such as communication, and the ability to participate/conduct discussion and debate.

2.2.7. Skill Enhancement Course (SEC): These courses are aimed at imparting practical skills, hands-on training, soft skills, etc., to enhance the employability of students and should be related to Major Discipline. They will aim at providing hands-on training, competencies, proficiency, and skill to students. SEC course will be a basket course to provide skill-based instruction. For example, SEC of English Discipline may include Public Speaking, Translation & Editing and Content writing.

2.2.8. Value-Added Courses (VAC):

i. Understanding India: The course aims at enabling the students to acquire and demonstrate the knowledge and understanding of contemporary India with its historical perspective, the basic framework of the goals and policies of national development, and the constitutional obligations with special emphasis on constitutional values and fundamental rights and duties. The course would also focus on developing an understanding among student-teachers of the Indian knowledge systems, the Indian education system, and the roles and obligations of teachers to the nation in general and to the school/community/society. The course will attempt to deepen knowledge about and understanding of India's freedom struggle and of the values and ideals that it represented to develop an appreciation of the contributions made by people of all sections and regions of the country, and help learners understand and cherish the values enshrined in the Indian Constitution and to prepare them for their roles and responsibilities as effective citizens of a democratic society.

ii. Environmental science/education: The course seeks to equip students with the ability to apply the acquired knowledge, skills, attitudes, and values required to take appropriate actions for mitigating the effects of environmental degradation, climate change, and pollution, effective waste management, conservation of biological diversity, management of biological resources, forest and wildlife conservation, and sustainable development and living. The course will also deepen the knowledge and understanding of India's environment in its totality, its interactive processes, and its effects on the future quality of people's lives.

iii. Digital and technological solutions: Courses in cutting-edge areas that are fast gaining prominences, such as Artificial Intelligence (AI), 3-D machining, big data analysis, machine learning, drone technologies, and Deep learning with important applications to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth.

iv. Health & Wellness, Yoga education, sports, and fitness: Course components relating to health and wellness seek to promote an optimal state of physical, emotional, intellectual, social, spiritual, and environmental well-being of a person. Sports and fitness activities will be organized outside the regular institutional working hours. Yoga education would focus on preparing the students physically and mentally for the integration of their physical, mental, and spiritual faculties, and equipping them with basic knowledge about one's personality, maintaining self-discipline and self-control, to learn to handle oneself well in all life situations. The focus of sports and fitness components of the courses will be on the improvement of physical fitness including the improvement of various components of physical and skills-related fitness like strength, speed, coordination, endurance, and flexibility; acquisition of sports skills including motor skills as well as basic movement skills relevant to a particular sport; improvement of tactical abilities; and improvement of mental abilities.

These are a common pool of courses offered by different disciplines and aimed towards embedding ethical, cultural and constitutional values; promote critical thinking. Indian knowledge systems; scientific temperament of students.

2.2.9. Summer Internship /Apprenticeship:

The intention is induction into actual work situations**.** All students must undergo internships / Apprenticeships in a firm, industry, or organization or Training in labs with faculty and researchers in their own or other HEIs/research institutions during the ***summer term***. Students should take up opportunities for internships with local industry, business organizations, health and allied areas, local governments (such as panchayats, municipalities), Parliament or elected representatives, media organizations, artists, crafts persons, and a wide variety of organizations so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability. Students who wish to exit after the first two semesters will undergo a 4-credit work-based learning/internship during the summer term to get a UG Certificate.

2.2.9.1. Community engagement and service: The curricular component of 'community engagement and service' seeks to expose students to the socio-economic issues in society so that the theoretical

learnings can be supplemented by actual life experiences to generate solutions to real-life problems. This can be part of summer term activity or part of a major or minor course depending upon the major discipline.

2.2.9.2. Field-based learning/minor project: The field-based learning/minor project will attempt to provide opportunities for students to understand the different socio-economic contexts. It will aim at giving students exposure to development-related issues in rural and urban settings. It will provide opportunities for students to observe situations in rural and urban contexts, and to observe and study actual field situations regarding issues related to socioeconomic development. Students will be given opportunities to gain a first-hand understanding of the policies, regulations, organizational structures, processes, and programmes that guide the development process. They would have the opportunity to gain an understanding of the complex socio-economic problems in the community, and innovative practices required to generate solutions to the identified problems. This may be a summer term project or part of a major or minor course depending on study.

2.2.10. Indian Knowledge System:

In view of the importance accorded in the NEP 2020 to rooting our curricula and pedagogy in the Indian context all the students who are enrolled in the four-year UG programmes should be encouraged to take an adequate number of courses in IKS so that the ***total credits of the courses taken in IKS amount to at least five per cent of the total mandated credits*** *(i.e. min. 8 credits for a 4 yr. UGP).* The students may be encouraged to take these courses, preferably *during the first four semesters of the UG programme*. At least half of these mandated credits should be in courses in disciplines which are part of IKS and are related to the major field of specialization that the student is pursuing in the UG programme. They will be included as a part of the total mandated credits that the student is expected to take in the major field of specialization. The rest of the mandated credits in IKS can be included as a part of the mandated Multidisciplinary courses that are to be taken by every student. All the students should take a Foundational Course in Indian Knowledge System, which is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. The foundational IKS course should be broad-based and cover introductory material on all aspects.

Wherever possible, the students may be encouraged to choose a suitable topic related to IKS for their project work in the 7/8th semesters of the UG programme.

2.2.11. Experiential Learning:

One of the most unique, practical & beneficial features of the National Credit Framework is assignment of credits/credit points/ weightage to the experiential learning including relevant experience and professional levels acquired/ proficiency/ professional levels of a learner/student. Experiential learning is of two types:

a. Experiential learning as part of the curricular structure of academic or vocational program. E.g., projects/OJT/internship/industrial attachments etc. This could be either within the Program-internship/ summer project undertaken relevant to the program being studied or as a part time employment (not relevant to the program being studied- up to certain NSQF level only). In case where experiential learning is a part of the curricular structure the credits would be calculated and assigned as per basic principles of NCrF i.e., 40 credits for 1200 hours of notional learning.

b. Experiential learning as active employment (both wage and self) post completion of an academic or vocational program. This means that the experience attained by a person after undergoing a particular educational program shall be considered for assignment of credits. This could be either Full or Part time employment after undertaking an academic/ Vocation program.

In case where experiential learning is as a part of employment the learner would earn credits as weightage. The maximum credit points earned in this case shall be double of the credit points earned with respect to the qualification/ course completed. The credit earned and assigned by virtue of relevant experience would enable learners to progress in their career through the work hours put in during a job/employment.

3. Approach to Curriculum Planning

The fundamental premise underlying the learning outcomes-based approach to curriculum planning and development is that higher education qualifications such as a Bachelor's Degree programmes are earned and awarded on the basis of (a) demonstrated achievement of outcomes (expressed in terms of knowledge,

understanding, skills, attitudes and values) and (b) academic standards expected of graduates of a programme of study.

The expected learning outcomes are used as reference points that would help formulate graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes which in turn will help in curriculum planning and development, and in the design, delivery, and review of academic programmes.

Learning outcomes-based frameworks (LOCF) in any subject must specify what graduates completing a particular programme of study are (a) expected to know, (b) understand and (c) be able to do at the end of their programme of study. To this extent, LOCF in Design is committed to allowing for flexibility and innovation in (i) programme design and syllabi development by higher education institutions (HEIs), (ii) teaching-learning process, (iii) assessment of student learning levels, and (iv) periodic programme review within institutional parameters as well as LOCF guidelines, (v) generating framework(s) of agreed expected graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes.

The key outcomes that underpin curriculum planning and development at the undergraduate level include Graduate Attributes, Qualification Descriptors, Programme Learning Outcomes, and Course Learning Outcomes.

The LOCF for undergraduate education is based on specific learning outcomes and academic standards expected to be attained by graduates of a programme of study. However, an outcome-based approach identifies moves way from the emphasis on what is to be taught to focus on what is learnt by way of demonstrable outcomes. This approach provides greater flexibility to the teachers to develop—and the students to accept and adopt—different learning and teaching pedagogy in an interactive and participatory ecosystem. The idea is to integrate social needs and teaching practices in a manner that is responsive to the need of the community and the future of the community. HEIs, on their turn, shall address to the situations of their students by identifying relevant and common outcomes and by developing such outcomes that not only match the specific needs of the students but also expands their outlook and values.

3.1. Nature and extent of the B.Des. Product Design

Product Design is a component of design that uses visuals that strategically convey a message or express information. Product Designers take an approach to engage their viewers and communicate the data and knowledge in the message clearly, majorly through print or electronic media. The key areas of study in communication design are:

1. Empathy mapping
2. Art Design History
3. Visualisation Techniques
4. Design Thinking
5. Colour Theory
6. Socio Cultural Understanding
7. Simple Product Design
8. Semiotics
9. Technically Complex Product
10. Ergonomics
11. Experiential Design
12. User Experience and Interface Design
13. System Design
14. Design Entrepreneurship

To broaden the interest for interconnectedness between formerly separate disciplines one can choose from the list of Generic electives for example one can opt for economics, physics, chemistry or any other subject of interest offered by different departments and schools of the Assam Royal Global University as one of the GE papers. Skill enhancement Courses enable the student acquire the skill relevant to the main subject. Choices from Discipline Specific Electives provides the student with liberty of exploring his interests within the main subject. Communication English and Behavioural Science are compulsory papers for students of

B.Des. Product Design which enable them to be a better communicator and develop better personality.

As a part of effort to enhance employability of design graduates, the well- structured programme empowers the students with the skills and knowledge leading to enhance career opportunities in various sectors of human activities.

3.2. Aims of B.Des. Programme in Product Design

The overall aims of B.Des. Product Design Programme are:

- To create strong interest in learning and understanding design.
- To be able to unlearn and get rid of societal and cognitive biases.
- To develop broad and balanced knowledge and understanding of the elements and principles of design.
- To enable the learners to familiarize with suitable methods and skill of design to solve specific problems of real world applicability and providing creative solutions.
- To provide sufficient knowledge and skills that enable the learners to undertake further studies in design and the areas on multiple disciplines concerned with design.
- To encourage the students to develop a range of generic skills helpful in employment, internships and social activities.
- To impart research-based knowledge to create interest for further study.
- To enable the students to become entrepreneurs and job creators.

4. Award of Degree in B.Des. Product Design

The structure and duration of undergraduate programmes of study offered by the University as per NEP 2020 include:

4.1. Undergraduate programmes of either 3 or 4-year duration with Single Major, with multiple entry and exit options, with appropriate certifications:

4.1.1. UG Certificate: Students who opt to exit after completion of the first year and have secured 40 credits will be awarded a UG certificate if, in addition, they complete one vocational course of 4 credits during the summer vacation of the first year. These students are allowed to re-enter the degree programme within three years and complete the degree programme within the stipulated maximum period of seven years.

4.1.2. UG Diploma: Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the UG diploma if, in addition, they complete one vocational course of 4 credits during the summer vacation of the second year. These students are allowed to re-enter within a period of three years and complete the degree programme within the maximum period of seven years.

4.1.3. 3-year UG Degree: Students who will undergo a 3-year UG programme will be awarded UG Degree in the Major discipline after successful completion of three years, securing 120 credits and satisfying the minimum credit requirement.

4.1.4. 4-year UG Degree (Honours): A four-year UG Honours degree in the majordiscipline will be awarded to those who complete a four-year degree programme with 160 credits and have satisfied the credit requirements as given in Table 6 in Section 5.

4.1.5. 4-year UG Degree (Honours with Research): Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research project or dissertation under the guidance of a Faculty Member of the University. The research project/dissertation will be in the major discipline. The students who secure 160 credits, including 12 credits from a research project/dissertation, will be awarded UG Degree (Honours with Research).

Award	Year	Credits to earn	Additional Credits	Re-entry allowed within (yrs)	Years to Complete
UG Certificate	1	40	4	3	7

UG Diploma	2	80	4	3	7
3-year UG Degree (Major)	3	120	x	x	x
4-year UG Degree (Honors)	4	160	x	x	X
4-year UG Degree (Honors with Research)	4	160	Students who secure cumulative 75%marks and above in the first sixsemesters		

5. Graduate Attributes

Sl.no.	Graduate Attribute	The Learning Outcomes Descriptors
GA 1	Disciplinary Knowledge	A student will acquire knowledge and understanding of one or more disciplines. It will provide basic knowledge of the elements and principles of Design.
GA 2	Complex problem solving	The program focuses on good research and ability to identify solution-based thinking, application of theoretical concepts to real life case studies on Product Design enabling students to develop problem solving skills.
GA 3	Analytical & Critical thinking	The students will be able to apply analytical thought including the analysis and evaluation of policies, and practices in the field of design. They will be able to identify relevant assumptions or implications. Identify logical flaws and holes in the arguments of others. Analyse and synthesize data from a variety of sources and draw valid conclusions and support them with evidence and examples.
GA 4	Creativity	A student will be able to draw connections between the knowledge gained and the creative task to be executed. Interpret the observations and sketch it into reality. A student will also be able think 'out of the box' and generate solutions to complex problems in unfamiliar contexts by adopting innovative, imaginative, lateral thinking, interpersonal skills, and emotional intelligence.
GA 5	Communication Skills	A student will develop the ability listen carefully, read texts, and research papers analytically, and present complex information in a clear and concise manner to different groups/audiences.
GA 6	Research-related skills	A Student will develop a keen sense of observation, inquiry, and capability for asking relevant/ appropriate questions. Should acquire the ability to problematize, synthesize and articulate issues and design research proposals, define problems, formulate appropriate and relevant research questions, formulate hypotheses, test hypotheses using quantitative and qualitative data, establish hypotheses, make inferences based on the analysis and interpretation of data, and predict cause-and-effect relationships. Should develop the ability to acquire the understanding of basic research ethics and skills in practicing/doing ethics in the field/ in personal research work.
GA 7	Collaboration	Capable of participating in project to work effectively and construct innovative end product in diverse teams both in classroom and in the design industry.

GA 8	Leadership readiness/qualities	A student will be able to operate and organize plan the tasks of a team or an organization and setting direction by formulating an inspiring vision and building a team that can help achieve the vision.
GA 9	Digital and technological skills	Demonstrate and experiment by other digital gadgets for learning, design, illustrate, and utilise relevant information using appropriate software for analysis of data and creation of end product.
GA 10	Environmental awareness and action	A student will identify the effects of environmental degradation, climate change, and pollution. They will develop and illustrate the technique of spreading awareness on effective waste management, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living by producing different Information Education and Communication (IEC) materials.

6. Programme Learning Outcome

PLO-1: Acquiring Knowledge of Product Design
(i) A systematic or coherent understanding of the academic field of Product Design, its different learning areas and applications, and its linkages with related disciplinary areas/subjects. (ii) Procedural knowledge that creates different types of professionals related to the area of study in Product Design, including research and development, teaching and government and public service. (iii) Skills in areas related to specialization area relating the subfields and current developments in the academic field of Product Design.

PLO-2: Ability of Solving Complex Problems
The students attain ability to quickly identify the problem and applying critical thinking skills and problem-solving analysis in all dimensions of development and production

PLO-3 - Analytical & Critical Thinking
The students will be able to apply analytical thought including the analysis and evaluation of policies, and practices in the field of media and media relations. Ability to understand and skills will be enhanced for identifying problems and issues relating to Product Design.

PLO-4: Develop and Demonstrate Creativity
A student will be able to demonstrate, perform, or think in different and diverse ways by using tools of design. The students will be able to deal with problems and situations that do not have simple solutions. They will be able to think ‘out of the box’ and generate solutions to complex problems in unfamiliar contexts by adopting innovative, imaginative, lateral thinking, interpersonal skills and emotional intelligence.

PLO-5: Enhance and Execute Communication Skills
The students will develop the ability to listen carefully, read texts and research papers analytically, and present complex information in a clear and concise manner to different groups/audiences through various means of communication. A student will be able to express thoughts and ideas effectively in writing, through films and also orally and communicate with others using appropriate media technologies.

PLO-6: Formulate Research-related Skills
A student will develop a keen sense of observation, inquiry, and capability for asking relevant/ appropriate questions. Should acquire the ability to problematize, synthesize and articulate issues and design research proposals, define problems, formulate appropriate and relevant research questions, formulate hypotheses, test hypothesis using quantitative and qualitative data, establish hypotheses, make inferences based on the analysis and interpretation of data, and predict cause-and-effect relationships. Students will develop the ability to acquire the understanding of basic research ethics and skills in practicing/doing
ethics in the field/ in personal research work.

PLO-7: Collaboration
Capable to work effectively and respectfully with diverseteams in the classroom and in the design industry in the interests of a common cause and work efficiently as a member of a team.

PLO-8: Develop Leadership Qualities
A student will be able to organize and operate the tasks of a team or an organization and setting direction by formulating an inspiring vision and building a team that can help achievethe vision.

PLO-9: Execute Digital and Technological Skills
The student will outline and examine using computers and other digital devices for learning, design, illustrate and utilize relevant information by using appropriate software's for analyzing of data and generate media related projects.

PLO 10: Identifying & Trying to Tackle Environmental Issues
A student will identify the effects of environmental degradation, climate change, and pollution. They will develop the technique and illustrate awareness on effective waste management, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living by producing different Information Education and Communication (IEC) materials.

7. Programme Specific Outcomes

PSO-1: Enable a student to be better and effective communicator in the field of design

PSO-2: Ability to illustrate ideas keeping in mind the principles and elements of design

PSO-3: Ability to apply design processes and thinking to problem solving assignments and projects

PSO-4: Enable a student to identify applications of design in other disciplines and in the real-world, leading to enhancement of career prospects in a relevant fields and research.

8. Teaching Learning Process

Teaching and learning in this programme involve classroom lectures as well as tutorial and remedial classes.

Tutorial classes: Tutorials allow closer interaction between students and teacher as each student gets individual attention. The tutorials are conducted for students who are unable to achieve average grades in their weekly assessments. Tutorials are divided into three categories, viz. discussion-based tutorials (focusing on deeper exploration of course content through discussions and debates), problem-solving tutorials (focusing on problem solving processes and quantitative reasoning), and Q&A tutorials (students ask questions about course content and assignments and consolidate their learning in the guiding presence of the tutor).

Flip classroom: flip classroom allow lecture content from face-to-face class time to before class by assigning it as homework. This allows for more interactive forms of learning to take place during class

Remedial classes: The remedial classes are conducted for students who achieve average and above average grades in their weekly assessments. The focus is laid to equip the students to perform better in the exams/assessments. The students are divided into small groups to provide dedicated learning support. Tutors are assigned to provide extra time and resources to help them understand concepts with advanced nuances. Small groups allow tutors to address their specific needs and monitor them. Following methods are adopted for tutorial and remedial classes:

- Written assignments and projects submitted by students
- Project-based learning
- Group discussions

- Home assignments
- Class tests, quizzes, debates organized in the department
- Seminars and conferences
- Extra-curricular activities like cultural activities, community outreach programmes etc.
- Field trip, excursions, study tour, interacting with eminent authors, etc.

Experiential Learning: Experiential learning is a part of the curricular structure of the Product Design program. E.g., projects/OJT/internship/industrial attachments etc. This could be either within the program-internship/ summer project undertaken relevant to the program being studied or as a part time employment.

9. Assessment Methods

<table>
<tr><th></th><th>Component of Evaluation</th><th>Marks</th><th>Frequency</th><th>Code</th><th>Weightage (%)</th></tr>
<tr><td>A</td><td>Continuous Evaluation</td><td></td><td></td><td></td><td></td></tr>
<tr><td>i</td><td>Analysis/Class test</td><td rowspan="5">Combination of any three from (i) to (v) with 5 marks each</td><td>1-3</td><td>C</td><td rowspan="6">25%</td></tr>
<tr><td>ii</td><td>Home Assignment</td><td>1-3</td><td>H</td></tr>
<tr><td>iii</td><td>Project</td><td>1</td><td>P</td></tr>
<tr><td>iv</td><td>Seminar</td><td>1-2</td><td>S</td></tr>
<tr><td>v</td><td>Viva /Presentation</td><td>1-2</td><td>V</td></tr>
<tr><td>vi</td><td>MSE</td><td>MSE shall be of 10 marks</td><td>1-3</td><td>Q/CT</td></tr>
<tr><td>vii</td><td>Attendance</td><td>Attendance shall be of 5 marks</td><td>100%</td><td>A</td><td>5%</td></tr>
<tr><td>B</td><td>Semester End Examination</td><td></td><td>1</td><td>SEE</td><td>70%</td></tr>
<tr><td></td><td>Project</td><td></td><td></td><td></td><td>100%</td></tr>
</table>

10. Structure of the Syllabus for 4 Year UG Programme

School Name- Royal School of Design
Department Name- Product Design
Program me Name- B.Des in Product Design

1st SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M111	Introduction to Design	100	3	1-0-4
	PRD082M112	Elements & Principles of Design	100	3	1-0-4
Minor	PRD082N111	Elements & Principles of Design	100	3	1-0-4
Interdisciplinary (IDC)	IKS992K101	Indian Knowledge System	100	3	3-0-0
Ability Enhancement course (AEC)	CEN982A101	Communicative English - 1(Introduction to Effective Communication)	100	1	1-0-0
Ability Enhancement course (AEC)	BHS982A102	Behavioral Science-I	100	3	1-0-4
Skill Enhancement course (SEC)	PRD082S111	Illustration Technique	100	3	1-0-4
Value Added Course (VAC)	VAC992V1415	Introduction to Graphic Design	100	3	3-0-0
Swayam Course		Understanding Design	100	3	
TOTAL CREDIT FOR 1st SEMESTER				20	
2nd SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M201	Engineering Drawing	100	3	3-0-0
	PRD082M212	Design Thinking	100	3	1-0-4
Minor	PRD082N211	Design Thinking	100	3	1-0-4
IDC	IDC0721211	Indian Knowledge System - 2	100	3	3-0-0
AEC	CEN982A201	Communicative English – II (Approaches to Verbal and Non-Verbal Communication)	100	1	1-0-0
AEC	BHS982A204	Behavioral Science-II	100	1	1-0-0
SEC	PRD082S211	Visualization Techniques	100	3	1-0-4

VAC	VAC992V2110	Design Thinking	100	3	1-0-4
Swayam Course		Design Innovation and Technology	100	3	
TOTAL CREDIT FOR 2nd SEMESTER				23	
3rd SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M301	Material Studies 1	200	4	4-0-0
	PRD082M312	Human Factors & Ergonomics	200	4	1-0-6
Minor	PRD082N311	Human Factors & Ergonomics	200	4	1-0-6
IDC	PRD082I311	Form Study	200	3	1-0-4
AEC	CEN982A301	Fundamentals of Business Communication	200	1	1-0-0
AEC	BHS982A304	Behvioural Sciences-III	200	1	1-0-0
SEC	PRD082S311	Form Study	200	3	1-0-4
Swayam Course		Process Equipment Design	200	3	
TOTAL CREDIT FOR 3rd SEMESTER				23	
4th SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M411	Product Analysis	200	4	1-0-6
	PRD082M412	Simple Product Design	200	4	1-0-6
	PRD082M403	Manufacturing Processes - 1	200	4	4-0-0
Minor	PRD082N411	Product Analysis	200	3	1-0-4
	PRD082N402	Material Studies	200	3	3-0-0
AEC	CEN982A401	Employability and Communication	200	1	2-0-0
AEC	BHS982A404	Behavioural Sciences-IV	200	1	1-0-0
Swayam Course		Augmenting Design Thinking with Human-Computer Interaction	200	3	
TOTAL CREDIT FOR 4th SEMESTER				23	
5th SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**

Major (Core)	PRD082M511	User Interface Graphics	300	4	1-0-6
	PRD082M512	User Experience	300	4	1-0-6
	PRD082M503	Material Studies - 2	300	4	1-0-6
Minor	PRD082N501	Manufacturing Processes	300	4	4-0-0
Internship	PRD082M521	4 weeks Internship after 4th Semester	300	4	
TOTAL CREDIT FOR 5th SEMESTER				20	
6th SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M601	Manufacturing Processes - 2	300	4	4-0-0
	PRD082M612	Packaging Design	300	4	1-0-6
	PRD082M613	Technically Complex Product	300	4	1-0-6
	PRD082M614	Socio – Cultural Design	300	4	1-0-6
Minor	PRD082N611	Packaging Design	300	4	1-0-6
TOTAL CREDIT FOR 6th SEMESTER				20	
7th SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M711	System Design	400	4	1-0-6
	PRD082M712	Product Detailing	400	4	1-0-6
	PRD082M703	Design for Sustainability	400	4	1-0-6
	PRD082M714	Research Methodology	400	4	1-0-6
Minor	PRD082N711	Design for Sustainability	400	4	1-0-6
TOTAL CREDIT FOR 7th SEMESTER				20	
8th SEMESTER					
COMPONENT	**COURSE CODE**	**COURSE TITLE**	**LEVEL**	**CREDIT**	**L-T-P**
Major (Core)	PRD082M811	Mobility Design	400	4	1-0-6
	PRD082N812	Portfolio Design	400	4	1-0-6
Project / Dissertation	PRD082M821	Dissertation/Research Project	400	12	
TOTAL CREDIT FOR 8th Sem				20	

1st Semester		
Paper 1 **Major Course**	**Introduction to Design** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M111** **Level : 100**

Course Objective : The objective of **Introduction to Design (PRD082M111)** is to bring about awareness of the world of design.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember to unlearn biases and improve their cognitive and knowledge base	BT1
CO2	Understand the importance of different art and culture movements	BT2
CO3	Apply the understanding of different art and culture movements in their work	BT3
CO4	Analyze and synthesize the work of designers in the field of design and art	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Learn to Unlearn:** Start pulling the students away from the logical conditioning of thought processes and pushing them to keep an open mind.	6	15
Unit 2	**History of Design:** Educate the class on the start and conception of design	6	15
Unit 3	**Famous Designers:** Work of designers of the world and their contributions	5	15
Unit 4	**The Future of Design:** Conceptualize on what the future of design can be. How design can provide and change the industry	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Poster making, Group Work, Debates & Discussions, Presentations and Quiz

Text Books :

1. Design as Art by Bruno Munari
2. Focus On : 100 most popular art movements by Various Authors of OK Publishing
3. Design is Story Telling by Ellen Lupton

Reference Books :

1. Bauhaus by Magdalena Droste and Peter Gossel
2. The Beauty of Everyday Things by Soetsu Yanagi
3. Design History and the History of Design by Judy Attfield, 1989
4. History of Modern Design by David Raizman, 2003
5. The History of Graphic Design by Jens Muller, 2022

1st Semester		
Paper 2 **Major Course**	**Elements & Principles of Design** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M112** **Level : 100**

Course Objective : The objective of **Elements & Principles of Design (PRD082M112)** is to develop skills in manual presentation techniques, use of various media of presentation, principles of compositions and principles of design.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Define concept of design and its elements that comprise it	BT1
CO2	Understand the usage of the principles of design	BT2
CO3	Apply the various principles of design in their compositions	BT3
CO4	Analyze and notice the principles of design used around them and knowing its application and purpose	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Elements of Design:** Lines, Shape, Form and Texture	6	15
Unit 2	**Principles of Design:** Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance	6	15
Unit 3	**Perspective and Isometric drawings:** One point, Two point and Three point perspective; Isometric & Orthographic drawings	5	15
Unit 4	**Gestalt Theory:** Law of Pragnanz, Good Continuity, Figure & Ground, Proximity, Similarity, Common Fate and Closure	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Group Work, Presentations

Text Books :

1. Universal Principles of Design by William Lidwell

Reference Books :

1. The Perspective workbook by Matthew Brehm
2. Arnheim, Gestalt and Art: A psychological theory by Ian Verstegen

1st Semester		
Paper **Minor Course**	**Elements & Principles of Design** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code:** **PRD082N111** **Level : 100**

Course Objective : The objective of **Elements & Principles of Design (PRD082N111)** is to develop skills in manual presentation techniques, use of various media of presentation, principles of compositions and principles of design.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Define concept of design and its elements that comprise it	BT1
CO2	Understand the usage of the principles of design	BT2
CO3	Apply the various principles of design in their compositions	BT3
CO4	Analyze and notice the principles of design used around them and knowing its application and purpose	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Elements of Design:** Lines, Shape, Form and Texture	6	15
Unit 2	**Principles of Design:** Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance	6	15
Unit 3	**Perspective and Isometric drawings:** One point, Two point and Three point perspective; Isometric & Orthographic drawings	5	15
Unit 4	**Gestalt Theory:** Law of Pragnanz, Good Continuity, Figure & Ground, Proximity, Similarity, Common Fate and Closure	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Group Work, Presentations

Text Books :

2. Universal Principles of Design by William Lidwell

Reference Books :

3. The Perspective workbook by Matthew Brehm
4. Arnheim, Gestalt and Art: A psychological theory by Ian Verstegen

Paper I/Subject Name: Introduction to Indian Knowledge System - I
Subject Code: IKS992I101
L-T-P-C – 3-0-0-3
Credit Units: 3
Course Level: 100

Course objectives:
This Foundation course is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. It would enable students to explore the most fundamental ideas that have shaped Indian Knowledge Traditions over the centuries.

Course Outcomes:
On completion of this course students will be expected to

CO	Contents	BT Level
CO_1	**Recall** about the natural endowments	BT level 1
CO_2	**Illustrate** literature of Indian civilization-the Vedic – Itihasas, languages, mathematics, and Ayurveda.	BT level 2
CO_3	**Explain** observation of the motion of celestial bodies in the Vedic corpus	BT level 2

Module	Course Contents	Periods
I	**Bharatavarsha—A Land of Rare Natural Endowments** Demographical features of the ancient Bharatvarsha, Largest cultivable area in the world. Protected and nurtured by Himalayas. The Sindhu-Ganga plain and the great coastal plains. The great rivers of India. Climatic changes: Abundant rains, sunshine and warmth, vegetation, animals and mineral wealth. Most populous country in the world. India's prosperity held the world in thrall. Splendid geographical isolation of India and the uniqueness of Indian culture.	10
II	**Foundational Literature of Indian Civilization:** The Vedic Corpus. The Itihasas— Ramayana and Mahabharata, and their important regional versions. The Puranas. Foundational Texts of Indian Philosophies, including the Jaina and Bauddha. Foundational Texts of Indian Religious Sampradayas, from the Vedic period to the Bhakti traditions of different regions. **i.** **The Vedangas and Other Streams of Indian Knowledge System**: The Vedic Corpus: Introduction to Vedas and synopsis of the four Vedas and Sub-classification of Vedas; Messages in Vedas; Introduction to Vedāṅgas : Siksha, Vyakarana, Chandas, Nirukta, Jyotisha and Kalpa ; Vedic Life: Distinctive Features. Other streams of Indian Knowledge System such as Ayurveda, Sthapatya, Natyasastra, Dharmasastra, Arthasastra, etc. The Indian way of continuing the evolution of knowledge through commentaries, interpretations and revisions of the foundational texts. The large corpus of literature in Indian languages. **ii.** **Indian Language Sciences:** Language Sciences and the preservation of the Vedic corpus. Varnamala of Indian languages based on classification of sounds on the basis of their origin and effort involved. The special feature of the scripts of most Indian languages, that each symbol is associated with a unique sound. Word formation in Sanskrit and Indian languages. Major insights in the Science of Vyakarana as established by Panini. Important texts of Indian Language Sciences — Siksha or phonetics, Nirukta or etymology, Vyakarana or Grammar, Chandas or Prosody. Navyanyaya and Navya-vyakarana in Navadvipa, Varanasi and West and South India. **iii.** **Indian Mathematics:** Numbers, fractions and geometry in the Vedas. Decimal nomenclature of numbers in the Vedas. Zero and Infinity. Simple constructions from Sulba-sutras. The development of the decimal place value system which resulted in a simplification of all arithmetical operations. Linguistic representation of numbers. Important texts of Indian mathematics. Brief introduction to the development of algebra, trigonometry and calculus. How Indian mathematics continued to flourish in the 18/19/20th centuries. Kerala School. Ramanujan.	20
III	**Indian Astronomy**: Ancient records of the observation of the motion of celestial bodies in the Vedic corpus. Sun, Moon, Nakshatra & Graha. Astronomy as the science of determination of time, place and direction by observing the motion of the celestial bodies. The motion of the Sun and Moon. Motion of equinoxes and solstices. Elements of Indian calendar systems as followed in different regions of India. Important texts of Indian Astronomy. Basic ideas of the planetary model of Aryabhata and its revision by Nilakantha. Astronomical instruments. How	15

	Indian astronomy continued to flourish in the 18/19th centuries. Astronomical endeavours of Jaisingh, Sankaravarman, Chandrasekhara Samanta.	
IV	**Indian Health Sciences:** Vedic foundations of Ayurveda. Ayurveda is concerned both with maintenance of good health and treatment of diseases. Basic concepts of Ayurveda. The three Gunas and Three Doshas, Pancha-mahabhuta and Sapta-dhatu. The importance of Agni (digestion). Six Rasas and their relation to Doshas. Ayurvedic view of the cause of diseases. Dinacharya or daily regimen for the maintenance of good health. Ritucharya or seasonal regimen. Important Texts of Ayurveda. Selected extracts from Astāngahrdaya (selections from Sūtrasthāna) and Suśruta-Samhitā (sections on plastic surgery, cataract surgery and anal fistula). The large pharmacopeia of Ayurveda. Charaka and Sushruta on the qualities of a Vaidya. The whole world is a teacher of the good Vaidya. Charaka's description of a hospital. Hospitals in ancient and medieval India. How Ayurveda continued to flourish till 18/19th centuries. Surgical practices, inoculation. Current revival of Ayurveda and Yoga.	15
	Total	60

Textbooks/Reference Books:

1. Baladev Upadhyaya, Samskrta Śāstrom ka Itihās, Chowkhambha, Varanasi, 2010.
2. D. M. Bose, S. N. Sen and B. V. Subbarayappa, Eds., A Concise History of Science in India, 2nd Ed., Universities Press, Hyderabad, 2010.
3. Astāngahrdaya, Vol. I, Sūtrasthāna and Śarīrasthāna, Translated by K. R. Srikantha Murthy, Vol. I, Krishnadas Academy, Varanasi, 1991.
4. Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
5. Dharampal, Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021
6. Dharampal, The Beautiful Tree: Indian Indigenous Education in the Eighteenth Century, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021.
7. J. K. Bajaj and M. D. Srinivas, Indian Economy and Polity in Eighteenth century Chengalpattu, in J. K. Bajaj ed., Indian Economy and Polity, Centre for Policy Studies, Chennai, 1995, pp. 63-84.
8. J. K. Bajaj and M. D. Srinivas, Annam Bahu Kurvita Recollecting the Indian Discipline of Growing and Sharing Food in Plenty, Centre for Policy Studies, Chennai, 1996.
9. J. K. Bajaj and M. D. Srinivas, Timeless India Resurgent India, Centre for Policy Studies, Chennai, 2001.
10. M. D. Srinivas, The methodology of Indian sciences as expounded in the disciplines of Nyāya, Vyākarana, Ganita and Jyotisa, in K. Gopinath and Shailaja D. Sharma (eds.), The Computation Meme: Explorations in Indic Computational Thinking, Indian Institute of Science, Bengaluru, 2022 (in press)

COURSE PROGRAMME: Under Graduate (All courses under RGU) SEMESTER: First

SUBJECT: Communicative English- I: Developing Oral Communication and Listening Skills

L-T-P-C- 1-0-0-1 Subject Code: CEN992101

Course Objective:

The course primarily aims to develop and enhance the students' oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Detailed Syllabus:

Modules	Course content/ Topics	Periods
I	**Basics of Communication- Introduction** Communication - definition – meaning – elements - basics of communication - communication process - importance of communication Components of Communication Types/forms of Communication (Oral-written, Formal-Informal(Grapevine), Interpersonal- Intrapersonal, Mass- Group, Verbal-Non Verbal External communication, Organizational Communication- Upward, Downward, horizontal, Diagonal) Non-verbal Communication - Introduction; Body language- Personal Appearance, Postures, Gestures, Eye Contact, Facial expressions Paralinguistic Features-Rate, Pause, Volume, Pitch/Intonation/ Voice/ modulation Proxemics , Haptics, Artifactics, Chronemics	4
II	**The Listening Process** Types of Listening – Superficial, Appreciative, Focused, Evaluative, Attentive, Emphatic Listening with a Purpose Barriers to Communication, Barriers to Listening	4
III	**Focusing on Oral Group Communication** Nature of group communication Characteristics of successful Group Communication Selection of group discussion-subject knowledge, leadership skills, team management Group Discussion Strategies	4
IV	**Language Styles- Oral and Written Communication** Technical Style ABC of technical communication- accuracy, using exact words and phrases, brevity, clarity. Objectivity of Technical Writing Impersonal language, Objectivity in professional speaking. Formal language, Practice	4

Text/Reference Books:

1. Rizvi, M.A. Effective Technical Communication. Tata McGraw Hill. New Delhi., 11 reprint. 2008
2. Kumar, Varinder. Communicative Functional English 1. Kalyani Publishers. New Delhi. 2012
3. Koneru, Aruna. Professional Communication.
4. Pocket guide to public speaking. Dan Ohair. Pub: Mac Higher. 5th edn

Subject Name: Behavioural Sciences -1 **UG 1st semester**

Course code:BHS982A102

Credit: 1

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

Course Outcomes: On completion of the course the students will be able to :
CO1: Understand self & process of self exploration
CO2: Learn about strategies for development of a healthy self esteem CO3: Apply the concepts to build emotional competencies.

Detailed Syllabus:

Modules	Course Contents	Periods
I	**Introduction to Behavioral Science** Definition and need of Behavioral Science,Self: Definition components, Importance of knowing self, Identity Crisis,Gender and Identity, Peer Pressure, Self image: Self Esteem, Johari Window ,Erikson's model.	4
II	**Foundations of individual behavior** Personality- structure, determinants, types of personalities. Perception: Attribution, Errors in perception. Learning- Theories of learning: Classical, Operant and Social	4
III	**Behaviour and communication.** Defining Communication, types of communication, barriers to communication, ways to overcome barriers to Communication, Importance of Non-Verbal Communication/Kinesics, Understanding Kinesics, Relation between behaviour and communication.	4
IV	**Time and Stress Management** Time management: Introduction-the 80:20, sense of time management, Secrets of time management, Effective scheduling. Stress management: effects of stress, kinds of stress-sources of stress, Coping Mechanisms. Relation between Time and Stress.	4
Total		**16**

Text books

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer &Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Sons Inc
- K.Alex, Soft skills; S.Chand

1st Semester		
Paper 7 **VAC**	**Introduction to Graphic Design** **L-T-P-C: 3-0-0-3 Credits: 3** **Scheme of Evaluation: Theory** **(30%)+ Project (20%)+ Continous Evaluation (50%)**	**Subject Code:** **VAC992V1415** **Level: 100**

Course Objective: To develop skills in digital presentation techniques, understanding of design process and critical thinking, principles of compositions and principles of design.

Course Outcome:

After successful completion of the course, student will be able to		
CO	**Course Outcome**	**Blooms Taxonomy Level**
CO 1	Identify key concept of design and its elements that comprise it.	BT1
CO 2	Understand the usage of the principles of design.	BT2
CO3	Apply the various principles of design in their compositions.	BT3

Detailed Syllabus :

Modules	**Topics & Course Content**
Unit 1	Elements of Design -Lines, Shape, Form, Texture
Unit 2	Principles of Design -Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance
Unit 3	Basic of Design Software -Basic Photoshop Tools, colours and its applications
Unit 4	Color Wheel -Primary, Secondary and Tertiary Colors
	Total

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Practical Assignments

Text Books :

1. *Universal Principles of Design by* William Lidwell
2. *The Perspective Workbook by* Matthew Brehm

Reference Books :

1. Arnheim, Gestalt and Art: A psychological theory by Ian Verstegen

Credit Distribution		
Lecture	***Practical***	***Experiential Learning***

48 hours	***-***	***42 hours*** - ***Project-20 hours*** - ***Home Assignments-12 hours*** - ***Self-learning 10 hours***

1st Semester		
Paper 4 **SEC**	**Illustration Techniques** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082S111** **Level : 100**

Course Objective : The objective of the course **Illustration Techniques (PRD082S111)** is to guide the students to enhance their hand skills with different media and materials

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the basics of hand rendering techniques	BT1
CO2	Demonstrate different methods of sketching and rendering	BT2
CO3	Apply different techniques through different mediums	BT3
CO4	Analyze different types of hand rendering techniques	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Pencil & Pen Illustration	6	15
Unit 2	Stippling, Charcoal	6	15
Unit 3	Watercolour, Paint	5	15
Unit 4	Oil Pastels	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Practical Assignments

Text Books :

1. Hand Drawn Illustration Techniques and Creative Expression by Kevn Todd

Reference Books :

1. A guide to pictorial perspective: With numerous illustrations by Benjamin Richard

2nd Semester		
Paper 1 **Major Course**	**Engineering Drawings** **L-T-P-C : 3-0-0-3 Credits : 3** **Scheme of Evaluation : Theory**	**Subject Code: PRD082M201** **Level : 100**

Course Objective : The objective of **Engineering Drawings (PRD082M201)** is to orient and equip the student with the technical skills of understanding all the information and requirements needed to manufacture an item or product.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember methodologies to be able to understand an engineering drawing	BT1
CO2	Understand how to create a 2D drawing interpreting a 3D form	BT2
CO3	Apply the techniques through all the data and information collected	BT3
CO4	To represent be able to represent and interpret complex drawings of objects & forms	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Types of Engineering Drawings	11	7
Unit 2	Drafting & Lettering	11	8
Unit 3	Dimensions & Tolerances	11	7
Unit 4	Projections & Views	11	8
	Total	**74**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	44 hours	30 hours	16 hours
			Drafting, Studio Work

Text Books :

1. Engineering Drawing, Third Edition by Basant Agrawal

Reference Books :

1. A Textbook of Engineering Drawing by RK Dhawan

2nd Semester		
Paper 2 **Major Course**	**Design Thinking** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M212** **Level : 100**

Course Objective : The objective of **Design Thinking (PRD082M212)** is to develop cognitive, strategic and practical thinking and ideation processes by which design concepts are developed.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the use of abductive and productive reasoning	BT1
CO2	Understand the theories and models of design thinking	BT2
CO3	Apply and adopt solution focused strategies.	BT3
CO4	Be able to analyze and resolve ill-defined or 'wicked' problems.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Empathy** – Know your topic, "Get Smart"	6	15
Unit 2	**Define –** Problem Framing, Finding opportunities & challenges	6	15
Unit 3	**Ideate –** Brainstorming & Iterations	5	15
Unit 4	**Test & Prototype -** Idea representation, Developing Concepts	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

Text Books :

1. Design Thinking Methodology Book by Emrah Yayici

Reference Books :

1. Design Your Thinking : The Mindsets, Toolsets and Skill Sets for Creative Problem Solving by Pavan Soni
2. The Design thinking playbook: Mindful digital transformation of teams, products, services, business and ecosystems by Michael Lewrick, Patrick Link

2nd Semester		
Paper 3 **Minor Course**	**Design Thinking** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082N211** **Level : 100**

Course Objective : The objective of **Design Thinking (PRD082N211)** is to develop cognitive, strategic and practical thinking and ideation processes by which design concepts are developed.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the use of abductive and productive reasoning	BT1
CO2	Understand the theories and models of design thinking	BT2
CO3	Apply and adopt solution focused strategies.	BT3
CO4	Be able to analyze and resolve ill-defined or 'wicked' problems.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Empathy** – Know your topic, "Get Smart"	6	15
Unit 2	**Define –** Problem Framing, Finding opportunities & challenges	6	15
Unit 3	**Ideate –** Brainstorming & Iterations	5	15
Unit 4	**Test & Prototype -** Idea representation, Developing Concepts	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

Text Books :

2. Design Thinking Methodology Book by Emrah Yayici

Reference Books :

3. Design Your Thinking : The Mindsets, Toolsets and Skill Sets for Creative Problem Solving by Pavan Soni
4. The Design thinking playbook: Mindful digital transformation of teams, products, services, business and ecosystems by Michael Lewrick, Patrick Link.

Paper II/Subject Name: Introduction to Indian Knowledge System - II
Subject Code: IKS992K201
L-T-P-C – 3-0-0-3
Credit Units: 3
Course Level: 100

Course objectives:
This Foundation course is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. It would enable students to explore the most fundamental ideas that have shaped Indian Knowledge Traditions over the centuries.

Course Outcomes:
On completion of this course students will be expected to –

CO	Contents	BT Level
CO_1	**Recall** about classical literature in Sanskrit and other languages	BT level 1
CO_2	**Recall** traditional Indian knowledge system and Indian education	BT level 1
CO_3	**Summarize the Indian** Art, Architecture, Agriculture, Polity and Economy	BT level 2

Module	Course Contents	Periods
I	**Classical Literature in Sanskrit and Other Indian Languages**: The nature and purpose of Kavya. Drisya and Sravya Kavyas. The ideas of Indian aestheticians on what constitutes the soul of Kavya. Important examples of classical literature in Sanskrit and other Indian languages **Indian Education**: Preservation of culture, tradition and Dharma through education. Svadhyaya, Pravachana. Also continuity of the family and the vamsha, who are the carriers of knowledge, tradition and Dharma. The extent, inclusiveness and the sophistication of indigenous education in early19th century India. **The Purpose of Knowledge in India**: Para Vidya and Apara Vidya. The corpus connected with Para Vidya. Learning and formalization of concepts associated with Para Vidya also form part of Apara. Apara Vidya. Nature and purpose of sciences, technologies, and all human knowledge concerning the world and the society. The concept of Rita, Dharma. The cycle of mutual dependence of humans and all aspect of creation. Yajna and the inviolable discipline of sharing and caring.	10
II	**Methodology of Indian Knowledge System**: Systematization of knowledge fields as Sastra. Each Sastra has a clearly defined purpose in Vyavahara. The means of valid knowledge (Pramanas). Perception (Pratyaksha), Inference (Anumana) and Textual Tradition (Agama), as discussed in the canonical texts of all the disciplines. The importance of Pratyaksha and Agama in relation to Anumana. **Indian Architecture and Town Planning**: The importance of Sthapatya-veda. The ancient cities of the Indus Saraswati region. Town planning and drainage systems. Examples of the significance of architecture and materials in Ramayana and Mahabharata. Public opulence and private austerity in Indian architecture. Why there are many more of Temples than Palaces. Important texts of Architecture and Sculpture. The prevalence of high Indian architecture in almost all parts of India except the Ganga plains. Examples of high Indian architecture from ancient and medieval periods from different parts of India. The building of Jaipur in the 18th century. How temple art and architecture continue to flourish in modern India.	20

	Indian Fine Arts: The importance of Gandharva-veda. Natyasastra on the nature and purpose of fine arts. Basic concepts of Indian music and dance. Important texts of Indian music, dance and painting. Indian musical instruments. Different schools of music, dance and painting in different regions of India. Important examples of Indian painting in various part of India. Musicology as a science. Harmonising Lakshya and Lakshana (practise and theory). Major developments in the science and practice of music the 17/18/19th centuries. The current revival of music and dance in India.	
III	**Indian Agriculture**: The significance of agriculture and irrigation as emphasised in the Ramayana, Mahabharata and other texts. Mention of Indian agriculture by the Greek historians and later travellers. Significance of agriculture and irrigation for the kings of Indian tradition. Major water-bodies of the ancient times. The Ery system of south India. Excellence of Indian agricultural technologies as observed by more recent European observers. Productivity of Indian agriculture in medieval Thanjavur and eighteenth century Allahabad, Chengalpattu, etc. Indian attitude towards agriculture, based on Walker and later reports. **Indian Textiles**: India as the ancient home of cotton and silk fabrics. Weaving formed the most significant part of Indian economy after agriculture. Varieties of textiles and dyes developed in different regions of India. India as a leading exporter of textiles in the world in the 17/18/19th centuries. **Indian Metallurgy:** Vedic references to metals and metal working. Mining and manufacture in India of Zinc, Iron, Copper, Gold, etc., from ancient times. Indian texts which refer to metallurgy. Important specimens of metal workmanship preserved/found in different parts of India. The significance and wide prevalence of ironsmith and other metal workers in the pre-modern era. European observers on the high quality and quantity of Indian iron and steel in the 18/19th centuries.	15
IV	**Indian Polity and Economy**: Indian conception of well-organised Polity and flourishing Economy as expounded in the foundational texts. The notion of Bharartavarsha as a Chakravarti-Kshetra and important attributes of Chakravartin. King as the protector of Dharma. King as the strength and support of the weak. King as the protector of Varta. King as the protector of the times. Meaning of Varta: Krishi, Gopalana and Vanijya forming the basis of Varta and the core of economic activity in society. The importance of sharing. Grama as the centre of the polity. **The Outreach of Indian Knowledge System**: The outreach of Indian Knowledge System beyond Indian boundaries forms the ancient times. Outreach to East, Southeast, Central and Southeast Asia of Indian phonetic script, decimal value place system-based arithmetic, algebra, astronomy and calendar, medical pharmacopeia, architecture, methods of making iron and steel, cotton textiles, etc. The transmission of Indian linguistics, knowledge of plants, iron and steel metallurgy, textiles and dyeing, shipbuilding etc., to Europe in 17/18/19th centuries. Current global outreach of Ayurveda, Yoga and Indian Fine Arts.	15
	Total	60

Textbooks/Reference Books:

1. Baladev Upadhyaya, Samskrta Śāstrom ka Itihās, Chowkhambha, Varanasi, 2010.
2. D. M. Bose, S. N. Sen and B. V. Subbarayappa, Eds., A Concise History of Science in India, 2nd Ed., Universities Press, Hyderabad, 2010.

3. Astāngahrdaya, Vol. I, Sūtrasthāna and Śarīrasthāna, Translated by K. R. Srikantha Murthy, Vol. I, Krishnadas Academy, Varanasi, 1991.
4. Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
5. Dharampal, Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021
6. Dharampal, The Beautiful Tree: Indian Indigenous Education in the Eighteenth Century, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021.
7. J. K. Bajaj and M. D. Srinivas, Indian Economy and Polity in Eighteenth century Chengalpattu, in J. K. Bajaj ed., Indian Economy and Polity, Centre for Policy Studies, Chennai, 1995, pp. 63-84.
8. J. K. Bajaj and M. D. Srinivas, Annam Bahu Kurvita Recollecting the Indian Discipline of Growing and Sharing Food in Plenty, Centre for Policy Studies, Chennai, 1996.
9. J. K. Bajaj and M. D. Srinivas, Timeless India Resurgent India, Centre for Policy Studies, Chennai, 2001.
10. M. D. Srinivas, The methodology of Indian sciences as expounded in the disciplines of Nyāya, Vyākarana, Ganita and Jyotisa, in K. Gopinath and Shailaja D. Sharma (eds.), The Computation Meme: Explorations in Indic Computational Thinking, Indian Institute of Science, Bengaluru, 2022 (in press).

COURSE PROGRAMME: Under Graduate (All courses under RGU) SEMESTER: Second

SUBJECT: Communicative English- II: Conversation and Public Speaking

L-T-P-C- 1-0-0-1 Subject Code: CEN982A201

Course Objective:

This course prepares students for a variety of academic and other situations in which formal presentations are required. Topics will include cultural conventions and speech, perceptions of others, and techniques of oral presentation and persuasion. Students will learn how to research, outline, and deliver short, informal presentations as well as longer speeches. This course will give them the opportunity to develop and strengthen skills in preparing and presenting public oral presentations in a variety of situations.

Detailed Syllabus:

Modules	Topics / Course content	Periods
I.	**Speaking Skills** Speaking – The Art of Speaking, Goals, Speaking Styles, The Speaking Process Importance of Oral Communication, Choosing the form of Communication, Principles & Guidelines of Successful Oral Communication, Barriers to Effective Oral CommunicationThree aspects of Oral Communication – Conversing, Listening and Body Language Intercultural Oral Communication	4
II.	**Conversational Skills : Listening and Persuasive Speaking** Introduction Conversation – Types of Conversation, Strategies for Effectiveness, Conversation Practice, Persuasive Functions in Conversation, Telephonic Conversation and Etiquette Dialogue Writing Conversation Control	4
III.	**Transactional Analysis** The Role of Intonation , Strokes Psychological Characteristics of Ego States (The Parent, The Adult, The Child) Structure and Aspects of Human Personality Analysing Transactions – Complementary Transactions, Crossed Transactions, Duplex or Ulterior Transactions How to Identify the Ego States of Interacting Individuals How to Manage Conversations, Structural Analysis Certain Habits of Ineffective Conversationalists	4

IV.	**Business Presentation and Public Speaking** Business Presentation and Speeches – Difference Elements of a Good Speech – Planning, Occasion, Audience, Purpose, Thesis, Material Organising and Outlining a Speech Outline Types of Delivery Guidelines for Delivery – Verbal Elements, Non-Verbal Elements, Vocal Elements, Visual Elements Controlling Nervousness and Stage Fright	**4**

Text/Reference Books:

1. Raman Meenakshi and Prakash Singh. Business Communication. Oxford University Press. Page 123 – 165
2. Raman Meenakshi and Sangeeta Sharma. Technical Communication. Oxford University Press. Page 137 – 148
3. Sengupta Sailesh. Business and Managerial Communication. PHILearning Pvt. Ltd. Page 136-153
4. Mehra Payal. Business Communication for Managers. Pearson. Page 75 – 83

Subject Name: Behavioural Sciences -II **UG 2nd semester**

Course code: BHS982A202

Credit: 1

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

Course outcomes: On completion of the course the students will be able to:
CO 1: Develop an elementary level of understanding of culture and its implications on personality of people.
CO2: Understand the concept of leadership spirit and to know its impact on performance of employees.
CO3: Understand and apply the concept of Motivation in real life.

Modules	Course Contents	Periods
I	**Culture and Personality** Culture: Definition, Effect, relation with Personality, Cultural Iceberg, Overview of Hofstede's Framework, Discussion of the four dimensions of Hofstede's Framework.	4
II	**Attitudes and Values** Attitude's definition: changing our own attitudes, Process of cognitive dissonance Types of Values, Value conflicts, Merging personal and Organisational values	4
III	**Motivation** Definition of motivation with example, Theories of Motivation (Maslow, McClelland's theory& Theory X and Y)	4
IV	**Leadership** Definition of leadership, Leadership continuum, types of leadership, Importance of Leadership, New age leaderships: Transformational & transactional Leadership, Leaders as role models.	4
Total		**16**

Text books:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer &Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Sons Inc.
- Organizational Behaviour by Kavita Singh (Vikas publishers, 3rd Edition).

2nd Semester		
Paper 4 **SEC**	**Visualisation Techniques** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082S211** **Level : 100**

Course Objective : The objective of **Visualization Techniques (PRD082S211)** is to orient and equip the student with skills to bring their ideas and imagination to reality and to be able to visualize and study data and represent them visually.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember methodologies to be able to visualize and interpret ideas	BT1
CO2	Understand how to create through a process of visualization	BT2
CO3	Apply the techniques through all the data and information collected	BT3
CO4	To represent ideas visually through different methodologies	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Creative Writing**	6	15
Unit 2	**Character Development**	6	15
Unit 3	**Creating Worlds**	5	15
Unit 4	**Development**	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

Text Books :

1. Visual Thinking for Design by Colin Ware

Reference Books :

1. Visual Thinking: Empowering People & Organizations Through Visual Communication

3rd Semester		
Paper 1 **Major Course**	**Material Studies - 1** **L-T-P-C : 4-0-0-4 Credits : 4** **Scheme of Evaluation : Theory**	**Subject Code: PRD082M301** **Level : 200**

Course Objective : The objectives of **Material Studies - 1 (PRD082M301**) is to impart the understanding basic of materials and its properties.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Define terms related to materials	BT1
CO2	Understand the properties of different materials	BT2
CO3	Apply the different uses and functions of materials in assignments	BT3
CO4	Analyse the use of materials in different applications	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Introduction to Workshop and tools**	28	0
Unit 2	**Plastics**	28	0
Unit 3	**Metal**	28	0
Unit 4	**Wood**	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming, Presentations

Text Books :

1. Basic Material Studies by PN Peapell and JA Belk
2. Wood: Materials and Processes by Louis John Fierer
3. Metal Working: Science and Engineering by Edward Mielnik
4. Brydsons Plastic Material by William Andrew

Reference Books :

1. Handbook of Plastic Materials and Processing Technology by EIRI board
2. Stuff Matters: Exploring the Marvelous Materials that shape our man made world by Mark Miodownik

3rd Semester		
Paper 2 Major Course	**Human Factors & Ergonomics L-T-P-C : 1-0-6-4 Credits : 4 Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M312 Level : 200**

Course Objective: The objective of **Human Factors & Ergonomics (PRD082M312)** is to learn the nature of ergonomics and human factors. Human Factor (Ergonomics) is the study of human abilities and characteristics which affect the design of equipment, systems, and jobs. Its study and appropriate applications aim at improving the working conditions, work methods, efficiency, performance, occupational safety, health and productivity of the system. This course helps the students identifying essential human factors and understanding the interactions between the different components of man, machine and his working environments fundamental to the design of user-friendly products and systems.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understanding Ergonomics Fundamental and the interdisciplinary nature of Ergonomics and its application in various fields.	BT1
CO2	Analyze and apply Ergonomic principles in designing workspaces for different environment	BT2
CO3	Develop a commitment to integrating Ergonomics into the workplace to promote health, safety and overall well-being	BT3
CO4	Apply critical thinking skills to analyze and solve ergonomic challenges in various setting.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Ergonomics • Definition and evolution of Ergonomics • Significance in enhancing human performance and comfort • Human Factors and Ergonomics • Distinction between Human Factors and Ergonomics • Interdisciplinary nature and applications	13	15
Unit 2	Human Anatomy and Physiology • Basic overview of Human Body Systems • Relevance to Ergonomic Considerations • Anthropometry • Practical applications in Design and workspace planning	13	15
Unit 3	User-Centred Design • Integrating user needs into design processes • The 7 Principles of Ergonomic Design • In-depth exploration of each principle with case studies • Practical application exercises	13	15
Unit 4	Ergonomics in Various Settings • Office Ergonomics, Industrial Ergonomics	13	15

	• Customizing Ergonomic solutions for specific environment • Ergonomics Assessment and Evaluation • Overview of Ergonomics Risk Assessment • Introduction to assessment tools and methodologies		
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	52 hours	60 hours	8 hours
			Brainstorming, Conceptualizing, Application, Analysis, Group Work, Sketching,

Text Books:

1. Fitting the Human: Introduction to Ergonomics/ Human Factors Engineering by Karl H.E Kroemer

Reference Books:

1. Introduction to Human Factors and Ergonomics by R. S. Bridger
2. Human Factors Engineering and Ergonomics by Stephen J. Guastello

3rd Semester		
Paper 3 Minor Course	**Human Factors & Ergonomics L-T-P-C : 1-0-6-4 Credits : 4 Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082N311 Level : 200**

Course Objective : The objective of **Human Factors & Ergonomics (PRD082N311)** is to learn the nature of ergonomics and human factors. Human Factor (Ergonomics) is the study of human abilities and characteristics which affect the design of equipment, systems, and jobs. Its study and appropriate applications aim at improving the working conditions, work methods, efficiency, performance, occupational safety, health and productivity of the system. This course helps the students identifying essential human factors and understanding the interactions between the different components of man, machine and his working environments fundamental to the design of user friendly products and systems.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understanding Ergonomics Fundamental and the interdisciplinary nature of Ergonomics and its application in various fields.	BT1
CO2	Analyze and apply Ergonomic principles in designing workspaces for different environment	BT2
CO3	Develop a commitment to integrating Ergonomics into the workplace to promote health, safety and overall well-being	BT3
CO4	Apply critical thinking skills to analyze and solve ergonomic challenges in various setting.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Ergonomics • Definition and evolution of Ergonomics • Significance in enhancing human performance and comfort • Human Factors and Ergonomics • Distinction between Human Factors and Ergonomics • Interdisciplinary nature and applications	13	15
Unit 2	Human Anatomy and Physiology • Basic overview of Human Body Systems • Relevance to Ergonomic Considerations • Anthropometry • Practical applications in Design and workspace planning	13	15
Unit 3	User-Centred Design • Integrating user needs into design processes • The 7 Principles of Ergonomic Design • In-depth exploration of each principle with case studies • Practical application exercises	13	15
Unit 4	Ergonomics in Various Settings • Office Ergonomics, Industrial Ergonomics • Customizing Ergonomic solutions for specific environment	13	15

	• Ergonomics Assessment and Evaluation • Overview of Ergonomics Risk Assessment • Introduction to assessment tools and methodologies		
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	52 hours	60 hours	8 hours
			Brainstorming, Conceptualizing, Application, Analysis, Group Work, Sketching,

Text Books:

2. Fitting the Human: Introduction to Ergonomics/ Human Factors Engineering by Karl H.E Kroemer

Reference Books:

3. Introduction to Human Factors and Ergonomics by R. S. Bridger
4. Human Factors Engineering and Ergonomics by Stephen J. Guastello

3rd Semester		
Paper 4 **Interdisciplinary**	**Form Study** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code:** **PRD082I311** **Level : 200**

Course Objective : Form is the language of surface. It has meaning, a definition and a measurement. Seeking the ideal form is to seek a certain experience and to fulfill a promise of the product. This course **Form Study (PRD082I311)** will develop an understanding towards the basics of form, form measurement, form transformations, transitions, and various expressions of form.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the techniques for form manipulation	BT1
CO2	Understand the topic towards perception, appreciation and articulation of the language of form and composition.	BT2
CO3	Apply the principles of form generation and composition.	BT3
CO4	To provide fundamental tools to creatively influence a given form or shape into a desirable product form.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to the fundamentals of design in three dimensions. Principles of composition and articulation of form using: radii manipulation, visual elements and perceptual and aesthetic sensibility.	6	15
Unit 2	Gestalt Laws of form perception and organization.	6	15
Unit 3	Working with planes through geometric relations, form integration, textures. Sensitization to the interplay of Dominant, Subdominant and Sub-ordinate elements in a three dimensional composition.	5	15
Unit 4	Drawing and model making to connect conceptualization and realization of form in two and three dimensions.	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Materials, Group Work, Sketching, Workshop

Text Books :

1. Drawing simplified : a textbook of form study and drawing by De Rosco Leo

2. Forms for People : Designing forms that people can use by Robert Barnett

Reference Books :

2. The Form of Study: Deciphering the language of Mass Produced Objects by Josiah Kahan

Type of Course: AEC

UG programmes Semester: 3rd Course Code: CEN982A301

Course Title: CEN III – Fundamentals of Business CommunicationTotal

Credits: 1

Course level: 200

L-T-P-C: 1-0-0-1

Scheme of Evaluation: Theory and Practical

Course Objective: The aim if the course is to develop essential business communication skills,including effective writing, speaking, and interpersonal communication, to enhance professional interactions, collaboration, and successful communication strategies within diverse corporate environments.

Course Outcomes: On successful completion of the course the students will be able to:

SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Define** and list business documents using appropriate formats and styles, demonstrating proficiency in written communication for various business contexts.	**BT 1**
CO 2	**Demonstrate** confident verbal communication skills through persuasive presentations, active listening, and clear articulation to	**BT 2**
	engage and influence diverse stakeholders.	
CO 3	**Apply** effective interpersonal communication strategies, including conflict resolution and active teamwork, to foster positive relationships and contribute to successful organizational communication dynamics	**BT 3**

Detailed Syllabus		
Units	**Course Contents**	**Periods**

I	**Business Communication: Spoken and Written** - The Role of Business Communication - Classification and Purpose of Business Communication - The Importance of Communication in Management - Communication Training for Managers - Communication Structures in Organizations - Information to be Communicated at the Workplace - Writing Business Letters, Notice, Agenda and Minutes	**5**

II	**Negotiation Skills in Business Communication**
	• The Nature and Need for Negotiation
	  o Situations requiring and not requiring negotiations
	• Factors Affecting Negotiation
	  o Location, Timing, Subjective Factors
	• Stages in the Negotiation Process
	  o Preparation, Negotiation, Implementation
	• Negotiation Strategies
		5

III	**Ethics in Business Communication** • Ethical Communication • Values, Ethics and Communication • Ethical Dilemmas Facing Managers • A Strategic Approach to Business Ethics • Ethical Communication on Internet • Ethics in Advertising	**5**
IV	**Business Etiquettes and Professionalism** • Introduction to Business Etiquette • Interview Etiquette • Social Etiquette • Workplace Etiquette • Netiquette	**5**

Text:

1. *Business Communication* by Shalini Verma

References:

1. *Business Communication* by PD Chaturvedi and Mukesh Chaturvedi
2. *Technical Communication* by Meenakshi Raman and Sangeeta Sharma

Credit Distribution		
Lecture/Tutorial	**Practicum**	**Experiential Learning**

15 hours	-	10 hours - Group Discussion - Presentation - Quiz - Case Study

Subject Name: Behavioural Sciences -III

UG 3rd semesterCourse code: BHS982A304

Credit: 1

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations .To enable the students to understand the process of problem solving and creative thinking.

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

CO1: Understand the process of problem solving and creative thinking.

CO2: Develop and enhance of skills required for decision-making.

Modules	Course Contents	Periods
I	**Problem Solving Process** Defining problem, the process of problem solving, Barriers to problem solving(Perception, Expression, Emotions, Intellect ,surrounding environment)	4
II	**Thinking as a tool for Problem Solving** What is thinking: The Mind/Brain/Behaviour Critical Thinking and Learning: -Making Predictions and Reasoning. -Memory and Critical Thinking. - Emotions and Critical Thinking.	4
III	**Creative Thinking** - Definition and meaning of creativity, - The nature of creative thinking :Convergent and Divergent thinking, - Idea generation and evaluation (Brain Storming) - Image generation and evaluation. - The six-phase model of Creative Thinking: ICEDIP model	4
IV	**Building Emotional Competence** Emotional Intelligence – Meaning, components, Importance and Relevance Positive and Negative emotions Healthy and Unhealthy expression of emotions	4
Total		**16**

Text books:

1. J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3,Management; Pfeiffer &Company
2. Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Son

3rd Semester		
Paper 5 **SEC**	**Form Study** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code:** **PRD082S311** **Level : 200**

Course Objective : Form is the language of surface. It has meaning, a definition and a measurement. Seeking the ideal form is to seek a certain experience and to fulfill a promise of the product. This course **Form Study (PRD082S311)** will develop an understanding towards the basics of form, form measurement, form transformations, transitions, and various expressions of form.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the techniques for form manipulation	BT1
CO2	Understand the topic towards perception, appreciation and articulation of the language of form and composition.	BT2
CO3	Apply the principles of form generation and composition.	BT3
CO4	To provide fundamental tools to creatively influence a given form or shape into a desirable product form.	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to the fundamentals of design in three dimensions. Principles of composition and articulation of form using: radii manipulation, visual elements and perceptual and aesthetic sensibility.	6	15
Unit 2	Gestalt Laws of form perception and organization.	6	15
Unit 3	Working with planes through geometric relations, form integration, textures. Sensitization to the interplay of Dominant, Subdominant and Sub-ordinate elements in a three dimensional composition.	5	15
Unit 4	Drawing and model making to connect conceptualization and realization of form in two and three dimensions.	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Materials, Group Work, Sketching, Workshop

Text Books :

3. Drawing simplified : a textbook of form study and drawing by De Rosco Leo

4. Forms for People : Designing forms that people can use by Robert Barnett

Reference Books :

3. The Form of Study: Deciphering the language of Mass Produced Objects by Josiah Kahane

4th Semester		
Paper 1 **Major Course**	**Product Analysis** **L-T-P-C : 1-0-6-4 Credits : 4** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M411** **Level : 200**

Course Objective : The objective of **Product Analysis (PRD082M411)** is to give essential understanding of what constitutes a product and all the sum of its parts.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember what defines a product	BT1
CO2	Understand the theories of building a product	BT2
CO3	Apply the understanding of the different parts that make a product	BT3
CO4	Analyze products and be able to define and construct its parts	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Exploded Views**	6	23
Unit 2	**Product Parts and Accessories**	6	23
Unit 3	**Component mapping**	5	22
Unit 4	**Analysis of parts and components**	5	22
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	22 hours	90 hours	8 hours
			Assignments, Sketching, Ideation, Analysing

Text Books:

1. Hooked: How to build habit building products by Nir Eyal
2. Product Design and Development by Karl Ulrich

Reference Books:

1. Designing Product People love: how great designers build successful products by Scott Hurff

4th Semester		
Paper 2 **Major Course**	**Simple Product Design** **L-T-P-C : 1-0-6-4 Credits : 4** **Scheme of Evaluation : Practicum/Jury**	**Subject Code: PRD082M412** **Level : 200**

Course Objective : The objective of **Simple Product Design (PRD082M412)** is to re think and re design simple daily products that are used.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the methods to design simple products	BT1
CO2	Understand the theories of simple products	BT2
CO3	Apply the understanding of designing simple products	BT3
CO4	Analyze different concepts and understanding of designing simple products	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**What is Simple Product Design**	6	23
Unit 2	**Form and Function**	6	23
Unit 3	**Elements and Principles**	5	22
Unit 4	**Form Development & Prototyping**	5	22
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	22 hours	90 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. The Complete book of Product Design by Steven Selikoff
2. The Design of Everyday Things by Don Norman

Reference Books:

1. Prototyping and Modelmaking for Product Design by Bjarki Halgrimsson
2. Product Design and Development by Karl Ulrich

4th Semester		
Paper 3 **Major Course**	**Manufacturing Processes - 1** **L-T-P-C : 4-0-0-4 Credits : 4** **Scheme of Evaluation : Theory**	**Subject Code: PRD082M403** **Level : 200**

Course Objective : The objective of **Manufacturing Processes - 1 (PRD082M403**) is to develop an in-depth understanding and knowledge of manufacturing processes.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Recall different terms and definitions related to manufacturing	BT1
CO2	Understand the different methods of manufacturing	BT2
CO3	Apply different methods of manufacturing to relevant products	BT3
CO4	Analyse the different manufacturing methods for relevant products and applications	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Manufacturing methods - Plastics	28	0
Unit 2	Manufacturing methods - Wood	28	0
Unit 3	Manufacturing methods - Metal	28	0
Unit 4	Machines and tooling	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. A textbook of manufacturing technology: Manufacturing processes by RK Rajput
2. Manufacturing Engineering and Technology by Serope Kalpakjian
3. Manufacturing Processes by JP Kaushish

Reference Books:

4. Product design for manufacture and assembly by Geoffrey Boothroyd

4th Semester		
Paper 4 **Minor** **Course**	**Product Analysis** **L-T-P-C : 1-0-4-3 Credits : 3** **Scheme of Evaluation : Practicum/Jury**	**Subject Code:** **PRD082N411** **Level : 200**

Course Objective : The objective of **Product Analysis (PRD082N411)** is to give essential understanding of what constitutes a product and all the sum of its parts.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember what defines a product	BT1
CO2	Understand the theories of building a product	BT2
CO3	Apply the understanding of the different parts that make a product	BT3
CO4	Analyze products and be able to define and construct its parts	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Exploded Views**	6	15
Unit 2	**Product Parts and Accessories**	6	15
Unit 3	**Component mapping**	5	15
Unit 4	**Analysis of parts and components**	5	15
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	22 hours	60 hours	8 hours
			Assignments, Sketching, Ideation, Analysing

Text Books:

1. Hooked: How to build habit building products by Nir Eyal
2. Product Design and Development by Karl Ulrich

Reference Books:

2. Designing Product People love: how great designers build successful products by Scott Hurff

4th Semester		
Paper 5 **Minor Course**	**Material Studies** **L-T-P-C : 3-0-0-3 Credits : 3** **Scheme of Evaluation : Theory**	**Subject Code: PRD082N402** **Level : 200**

Course Objective : The objectives of **Material Studies (PRD082N401**) is to impart the understanding basic of materials and its properties.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Define terms related to materials	BT1
CO2	Understand the properties of different materials	BT2
CO3	Apply the different uses and functions of materials in assignments	BT3
CO4	Analyse the use of materials in different applications	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Introduction to Workshop and tools**	20	0
Unit 2	**Plastics**	20	0
Unit 3	**Metal**	21	0
Unit 4	**Wood**	21	0
	Total	**82**	

National Credit Hours for the course : 30 x 3 = 90

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
3	82 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming, Presentations

Text Books :

1. Basic Material Studies by PN Peapell and JA Belk
2. Wood: Materials and Processes by Louis John Fierer
3. Metal Working: Science and Engineering by Edward Mielnik
4. Brydsons Plastic Material by William Andrew

Reference Books :

1. Handbook of Plastic Materials and Processing Technology by EIRI board
2. Stuff Matters: Exploring the Marvelous Materials that shape our man made world by Mark Miodownik

Type of Course: AEC (w.e.f. 2023-24)UG programmes

Semester: 4th Course Code: CEN982A401

Course Title: CEN IV – Employability and Communication

Total credits: 1

Course level: 200

L-T-P-C: 1-0-0-1

Scheme of Evaluation: Theory and Practical

Course Objectives: This course is designed to enhance employability and maximize the students' potential by introducing them to the principles that determine personal and professional success, thereby helping them acquire the skills needed to apply these principles in their lives and careers.

Course Outcomes: After the successful completion of the course, the students will be able to

SI No	Course Outcome	Blooms Taxonomy Level
CO 1	**Demonstrate** understanding the importance of verbal and non-verbal skills while delivering an effective presentation.	BT 2
CO 2	**Develop** professional documents to meet the objectives of theworkplace	BT 3
CO 3	**Define** and identify different life skills and internet competencies required in personal and professional life.	BT 3

Detailed Syllabus		
Units	**Course Contents**	**Periods**
I	**Presentation Skills** Importance of presentation skills, Essential characteristics of a good presentation, Stages of a presentation, Visual aids in presentation, Effective delivery of a presentation	5
II	**Business Writing** Report writing: Importance of reports, Types of reports, Format of reports, Structure of formal reports Proposal writing: Importance of proposal, Types of proposal,structure of formal proposals Technical articles: Types and structure	5

III	**Preparing for jobs** Employment Communication and its Importance, Knowing the four-step employment process, writing resumes, Guidelines for a good resume, Writing cover letters Interviews: Types of interview, what does a job interview assess, strategies of success at interviews, participating in group discussions.	**5**
IV	**Digital Literacy and Life Skills** **Digital literacy:** Digital skills for the '21st century', College studentsand technology, information management using Webspace, Dropbox,directory, and folder renaming conventions. Social Media Technology and Safety, Web 2.0. **Life Skills**: Overview of Life Skills: Meaning and significance of lifeskills, Life skills identified by WHO: self-awareness, Empathy, Critical thinking, Creative thinking, Decision making, problem- solving, Effective communication, interpersonal relationship, copingwith stress, coping with emotion. Application of life skills: opening and operating bank accounts, applying for pan, passport, online bill payments, ticket booking, gas booking	**5**

Keywords: Employability, business writing, presentation skills, life skills

Text:

1. *Business Communication* by PD Chaturvedi and Mukesh Chaturvedi

References:

1. *Business Communication* by Shalini Verma References:
2. *Technical Communication* by Meenakshi Raman and Sangeeta Sharma
3.

Credit Distribution		
Lecture/Tutorial	**Practicum**	**Experiential Learning**
15 hours	-	10 hours - Movie/ Documentary screening - Field visits - Peer teaching - Seminars - Library visits

Subject Name: Behavioural Sciences -IV

UG 4th semesterCourse code: BHS982A404

Credit: 1

Course objectives: To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

Course outcomes: On completion of the course the students will be able to:CO1**:** Understand the importance of individual differences CO2: Develop a better understanding of self in relation to society and nationCO3: Facilitation for a meaningful existence and adjustment in society

Modules	Course Contents	Periods
I	**Managing Personal Effectiveness** Setting goals to maintain focus, Dimensions of personal effectiveness (self disclosure, openness to feedback and perceptiveness), Integration of personal andorganizational vision for effectiveness, A healthy balance of work and play, Defining Criticism: Types of Criticism, Destructive vs Constructive Criticism, Handling criticism and interruptions.	**4**
II	**Positive Personal Growth** Understanding & Developing positive emotions, Positive approach towards future, Impact of positive thinking, Importance of discipline and hard work, Integrity and accountability, Importance of ethics in achieving personal growth.	**4**
III	**Handling Diversity** Defining Diversity, Affirmation Action and Managing Diversity, Increasing Diversity in Work Force, Barriers and Challenges in Managing Diversity.	**4**
IV	**Developing Negotiation Skills** Meaning and Negotiation approaches (Traditional and Contemporary)Process and strategies of negotiations. Negotiation and interpersonal communication. Rapport Building – NLP.	**4**
Total		**16**

Text books:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3,Management; Pfeiffer &Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & SonsInc.

5h Semester		
Paper 1 **Major Course**	**User Interface Graphics** **L-T-P-C : 1-0-6-4 Credits : 4** **Scheme of Evaluation : Practical/Jury**	**Subject Code: PRD082M511** **Level : 200**

Course Objective : The objective of **User Interface Graphics (PRD082M511**) is to give an understanding of interactive graphic interfaces and its kinds.

Course Outcome :

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the principles of interface design	BT1
CO2	Demonstrate different methods of interaction with interfaces	BT2
CO3	Apply the knowledge of interface design	BT3
CO4	Analyze user interface designs for real world applications	BT4

Detailed Syllabus :

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to UI	28	0
Unit 2	User Research	28	0
Unit 3	Prototyping	28	0
Unit 4	Usability Evaluation	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

5. The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, 2ed by Wibert O. Galbitz

6. User Friendly: How the Hidden Rues of Design are Changing the way We Live, Work & Play by Cliff Kuang, Robert Fabricant.

Reference Books:

7. Laws of UX by Jon Yablonski

5h Semester		
Paper 2 **Major Course**	**User Experience** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Practical/Jury**	**Subject Code: PRD082M512** **Level: 200**

Course Objective: The objective of **User Experience(PRD082M512** is to give an understanding of interactive graphic interfaces and its kinds.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Remember the different methods undertaken to study user experiences.	BT1
CO2	Demonstrate different methods of understanding user experience design	BT2
CO3	Apply the knowledge and methods of user experience design	BT3
CO4	Analyze user experience designs for real world applications	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to UX	28	0
Unit 2	Research and Accessibility	28	0
Unit 3	Information Architecture	28	0
Unit 4	Laws of UX	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1.UX Design and Usability Mentor Book: With Best Practice Business Analysis and User Interface Design Tips and Techniques by Emrah Yayici
2. The Golden Ratio in UX Design: And Other Articles on User Expereince by Amolendu H

Reference Books:

8. Laws of UX by Jon Yablonski

5h Semester		
Paper 3 **Major Course**	**Material Studies 2** **L-T-P-C: 4-0-0-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M503** **Level: 200**

Course Objective: The objective of **Material Studies 2 (PRD082M503**) is to develop knowledge of the physical, mechanical, thermal and aesthetic properties of different materials.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Demonstrate Knowledge of Material Properties	BT1
CO2	Make Informed Material Selections	BT2
CO3	Understand and Apply Sustainable Practices	BT3
CO4	Develop Hands-on Material Experimentation Skills	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Advanced Material Properties: In- depth analysis of mechanical, thermal and electrical properties of materials	28	0
Unit 2	Material Selection: Criteria and methodologies for choosing appropriate materials based on product requirement and performance	28	0
Unit 3	Sustainable Materials: Exploration of eco-friendly and sustainable material options, considering environmental impact.	28	0
Unit 4	Manufacturing Processes: Study of advanced manufacturing techniques and their influence on material properties and product design	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. Material and Design: The Art and Science of Material Selection in Product Design by Michael F. Ashby and Kara Johnson
2. Materials Selection in Mechanical Design by Michael F. Ashby.
3. The Mechanical Design Process by David G. Ullman.

Reference Books:

1.Handbook of Materials for Product Design by Charles A. Harper.
2. The Industrial Design Reference & Specification Book: Everything Industrial Designers Need to know Everyday by Dan Cuffaro and Issac Zaksenberg.
3. Phaidon Design Classics by Phaidon Press

5h Semester		
Paper 4 **Minor Course**	**Manufacturing Processes** **L-T-P-C: 4-0-0-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082N501** **Level: 200**

Course Objective: The objective of **Manufacturing Processes (PRD082N501**) is to understand the various manufacturing techniques, enabling them to make informed design decisions and develop production-ready products.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand Manufacturing Fundamentals	BT1
CO2	Apply Material Processing Techniques	BT2
CO3	Utilize Digital & Advanced Manufacturing	BT3
CO4	Implement Design For Manufacturing & Assembly	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Manufacturing Processes: Definition and importance of manufacturing in product design. Classification of Manufacturing Processes .	28	0
Unit 2	Material Processing Techniques: Metals Processing. Plastic & Polymer processing. Wood and Bamboo Processing. Composition & Advanced Materials	28	0
Unit 3	Surface Finishing & Quality Control	28	0
Unit 4	Sustainable & Eco-friendly Manufacturing	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. Manufacturing Engineering & Technology by Serope Kalpakjian & Steven Schmid
2. Fundamentals of Modern Manufacturing: Materials, Processes and Systems by Mikell P. Groover.
3. Manufacturing Processes for Design Professionals by Rob Thompson
4. Materials and Manufacturing: An Introduction to How they Work and Why It Matters by Mark Atwater.
5. The Complete Guide to Mold Making with SolidWorks by Paul Tran

Reference Books:

1.Smart Manufacturing : The Digital Transformation by Venkatesh Upadhyay

2. Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing by Ian Gibson, David W Rosen, Brent Stucker.

6th Semester		
Paper 1 **Major Course**	**Manufacturing Processes -2** **L-T-P-C: 4-0-0-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M601** **Level: 200**

Course Objective: The objective of **Manufacturing Processes 2 (PRD082M601**) is to equip students with the knowledge and skills required to understand, select and apply various manufacturing techniques.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand Core Manufacturing Principles	BT1
CO2	Apply Advanced Material Processing Techniques	BT2
CO3	Utilize Digital & Automated Manufacturing	BT3
CO4	Implement Design for Manufacturing & Assembly	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Advanced Material Processing: High-Precision Machining; Advanced Metal Forming; Composite & Hybrid manufacturing.	28	0
Unit 2	Digital & Automated Manufacturing: Industry & Smart Manufacturing; Advanced 3D Printing & Additive Manufacturing	28	0
Unit 3	Surface Finishing & Coating Technologies: Coating Processes; Surface Texturing & Aesthetics.	28	0
Unit 4	Sustainable & Eco-Friendly Manufacturing: Green Manufacturing Practices; Bamboo & Bio-based Manufacturing.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. Manufacturing Engineering and Technology by Serope Kalpakjian & Steven Schmid.
2. Processes and Materials of Manufacture by Roy A. Lindberg.
3. Manufacturing Processes for Design Professionals by Rob Thompson
4. Materials and Manufacturing: An Introduction to How they Work and Why It Matters by Mark Atwater.

Reference Books:

1.Advanced Manufacturing Processes by V.K. Jain.
2. Additive Manufacturing Technologies by Ian Gibson, David W. Rosen and Brent Stucker.
3. Manufacturing Processes for Design Professionals by Rob Thompson

6th Semester		
Paper 1 **Major Course**	**Packaging Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M612** **Level: 200**

Course Objective: The objective of **Packaging Design (PRD082M612**) to develop a comprehensive understanding of packaging design principles and their role in product communication and protection.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Theoretical knowledge of packaging design	BT1
CO2	Material selection & manufacturing techniques	BT2
CO3	Functional & aesthetic packaging development	BT3
CO4	Sustainable & eco-friendly packaging strategies	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Packaging Design: Definition & Importance of Packaging; Types of packaging.	28	0
Unit 2	Materials & Manufacturing for Packaging: Material Selection; Manufacturing Techniques.	28	0
Unit 3	Structural & Functional Aspects of Packaging: Structural Packaging; Functional Packaging Considerations	28	0
Unit 4	Prototyping, Testing & Industry Applications: Packaging Prototyping Methods; Testing & Regulations.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. Packaging Sustainability: Tools, Systems and Strategies for Innovative Package Design by Wendy Jedlicka
2.The future of Packaging: from Linear to Circular by Tom Szaky
3. Smart Packaging Technologies for Fast Moving Consumer Goods y Joseph Kerry

Reference Books:

1. Packaging Design: Successful Product Branding from Concept to Shelf by Marianne Rosner Limchuk, Sandra A. Krasovec
2. The Big Book of Packaging by Will Burke , Lisa Baer, James Pietruszynski.
3. Sustainable packaging by Scott

6th Semester		
Paper 2 **Major Course**	**Technically Complex Product** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M613** **Level: 200**

Course Objective: The objective of **Technically Complex Product (PRD082M613**) to develop an understanding of technically complex products, their design challenges, engineering constraints and user needs.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand the fundamental of technically complex products	BT1
CO2	Apply advanced materials & manufacturing techniques	BT2
CO3	Integrate Mechanical, Electrical and Digital Systems.	BT3
CO4	Develop Prototyping & Testing Strategies	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Technically Complex Products: Definition & Classification of complex products	28	0
Unit 2	Material Selection & Advanced Manufacturing: High-performance materials; manufacturing methods.	28	0
Unit 3	Electronics, Mechatronics & Smart Products: Introduction to sensors, actuators, microcontrollers; Basics of embedded systems and human-machine interfaces.	28	0
Unit 4	Prototyping, Testing & Validation: CAD, Rapid Prototyping and iterative Testing in product development; functional testing; compliance & safety standards in product testing.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

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

2.The Art of Product Design: Changing How Things Get Made by Hardi Meybaum.
3. Engineering Design: A systematic Approach by G.Pahl & W. Beitz.

Reference Books:

1. Product Design for Manufacture and Assembly by Geoffrey Boothroyd, Peter Dewhurst, Winston Knight.
2. Design for Manufacturability: How to use concurrent engineering to rapidly develop low-cost, high-quality products by David M. Anderson.

6th Semester		
Paper 5 **Minor Course**	**Packaging Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code:** **PRD082N611** **Level: 200**

Course Objective: The objective of **Packaging Design (PRD082N611**) to develop a comprehensive understanding of packaging design principles and their role in product communication and protection.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Theoretical knowledge of packaging design	BT1
CO2	Material selection & manufacturing techniques	BT2
CO3	Functional & aesthetic packaging development	BT3
CO4	Sustainable & eco-friendly packaging strategies	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Packaging Design: Definition & Importance of Packaging; Types of packaging.	28	0
Unit 2	Materials & Manufacturing for Packaging: Material Selection; Manufacturing Techniques.	28	0
Unit 3	Structural & Functional Aspects of Packaging: Structural Packaging; Functional Packaging Considerations	28	0
Unit 4	Prototyping, Testing & Industry Applications: Packaging Prototyping Methods; Testing & Regulations.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1. Packaging Sustainability: Tools, Systems and Strategies for Innovative Package Design by Wendy Jedlicka
2.The future of Packaging: from Linear to Circular by Tom Szaky
3. Smart Packaging Technologies for Fast Moving Consumer Goods y Joseph Kerry

Reference Books:

1. Packaging Design: Successful Product Branding from Concept to Shelf by Marianne Rosner Limchuk, Sandra A. Krasovec
2. The Big Book of Packaging by Will Burke , Lisa Baer, James Pietruszynski.
3. Sustainable packaging by Scott Bolyston

6th Semester		
Paper 4 **Major Course**	**Socio-Cultural Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M614** **Level: 200**

Course Objective: The objective of **Socio- Cultural Design (PRD082M614**) to introduce the fundamental concepts of sociology and cultural studies in the context of product design.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand the Role of Sociology in Design	BT1
CO2	Conduct Ethnographic & Cultural Research	BT2
CO3	Analyze Design & Cultural Identity	BT3
CO4	Develop Products with Socio-cultural relevance	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Sociology & Cultural studies in Design: Definition; Cultural studies & design; material culture.	28	0
Unit 2	Understanding user behavior & social patterns: User psychology & social influence in product design; consumer behavior in different cultures.	28	0
Unit 3	Ethnographic Research & Design: Research Methods; Cultural mapping & persona development.	28	0
Unit 4	Design and Cultural identity: Cultural semiotics; traditional craftsmanship vs modern design; local vs global design perspectives.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1.The Design of Everyday Things by Don Norman.
2.Design for the Real World: Human Ecology and Socio Change by Victor Papanek
3. The Socio Design Reader by Elizabeth Resnick.
4. Ethnography For Designers by Galen Cranz

Reference Books:

1. The Culture Code: An Ingenious way to understand why people around the world live and buy as they do. By Clotaire Rapaille
2. The Language of Things. By Deyan Sudjic.
3.Indigenous Knowledge and Ethics in Design. By Elizabeth Guffey.

7th Semester		
Paper 1 **Major Course**	**System Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M711** **Level: 200**

Course Objective: The objective of **System Design (PRD082M711)** to introduce systems thinking and its application in product design.

Course Outcome:

After successful completion of the course, student will be able to		
COS	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand the Fundamentals of System Design	BT1
CO2	Analyze and Model Complex Systems	BT2
CO3	Apply Human-Centered and Sustainable System Design Solutions	BT3
CO4	Develop and Prototype Systematic Design Solutions	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Systems Thinking: Definations & Principles of Sytems Thinking; Types of Sytems.	28	0
Unit 2	Sytem Mapping & Interactions and Dependencies: Understanding Interactions & Dependencies; Flow Diagrams.	28	0
Unit 3	Human-Centered System Design: User Research & Behavioral Analysis in System Design; Service Design & Experience Mapping.	28	0
Unit 4	Sustainability & Circular Systems: Cradle- to- cradle Design; Lifecycle Analysis; Eco-friendly product-sevice systems.	28	0
	Total	**112**	

National Credit Hours for the course : 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Text Books:

1.Thinking in Systems: A Primer. By Donella Meadows

2.Sytems Engineering and Analysis. By Benjamin Blanchard.
3. Universal Principles of Design. By William Lidwell.
4. Design Thinking: Understanding How Designers Think and Work. By Nigel Cross

Reference Books:

1. Life Cycle Thinking in Sustainable Product Development. By Mikko Jalas, Helena Dahlbo.
2. This is Service Design Thinking. By Marc Stickdorn & Jakob Schneider
3. Design Interactions. By Bill Moggridge.

7th Semester		
Paper 2 **Major Course**	**Product Detailing** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M712** **Level: 200**

Course Objective: The objective of **Product Detailing (PRD082M712**) to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Demonstrate Technical Detailing Skills	BT1
CO2	Optimize Design for manufacturability& Assembly	BT2
CO3	Integrate Material & Process Knowledge into Detailing	BT3
CO4	Enhance Aesthetics & Ergonomics through Detailing	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Product Detailing?	28	0
Unit 2	Technical Detailing & Tolerancing: Geometric Dimensioning & Tolerancing; Types of Fits; Fasteners, Joints and Assembly Mechanisms	28	0
Unit 3	Material & Process-Oriented Detailing: Impact of Material Selection on Detailing; Surface Finishing Techniques; Joining & Assembly Techniques	28	0
Unit 4	CMF & Surface Detailing: Visual & Textural Detailing for User experience; CMF Strategy in Branding & Product Identity, Ergonomics & Haptics in Surface Detailing	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.The Fundamentals of Product Design. By Richard Morris.
2.Product Design: Techniques in Reverse Engineering & new Product Development. By Kevin Otto & Kristin Wood.
3.Detailing for Industrial Designers. By Michael Rowe.
4. Making It: Manufacturing Techniques for Product Design. By Chris Lefteri.

Reference Books:

1. The Measure of Man and Woman: Human Factors in Design. By Alvin R. Tilley
2. Universal Principles of Design. By William Lidwell.

7th Semester		
Paper 3 **Major Course**	**Design for Sustainability** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M703** **Level: 200**

Course Objective: The objective of **Design for Sustainability (PRD082M703)** to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand Sustainability in Design	BT1
CO2	Analyze and Apply Sustainable Material Choices	BT2
CO3	Integrate Sustainable Thinking into Design	BT3
CO4	Develop Sustainable Product Solutions	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Sustainable Design: Sustainability & Environmental Impact of Design; Sustainable Development Goals (SDGs) in Product Design; Circular Economy & Cradle - to- Cradle Approach.	28	0
Unit 2	Materials & Manufacturing for Sustainability: Eco-Friendly& Recycled Materials; Sustainable Manufacturing & Low-waste Production; Lifecycle Assessment.	28	0
Unit 3	Design For Longevity & Low Impact: Modular & Repairable Product Design; Design for Disassembly & Upcycling; Minimalism & Low-Impact Consumption Models	28	0
Unit 4	Biomimicry & Nature- Inspired Solutions: Biomimicry in Product Design; Energy-Efficient & Passive Design Strategies	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.Sustainable Design: A Critical Guide. By David Bergman
2. Designing for Sustainability: A Guide to Building Greener Digital Products. By Tim Frick
3.Design for Sustainability: A Step-by- Step Approach. By Jan Kuijk
4. Biomimicry: Innovation Inspired by Nature. By Janine Benyus

Reference Books:

1. Eco- Design: Integrating Environmental Aspects into Product Design. By Ernst Worrell.
2. Materials and Sustainable Development. By Michael F. Ashby.

7th Semester		
Paper 4 **Major Course**	**Research Methodology** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M714** **Level: 200**

Course Objective: The objective of **Research Methodology (PRD082M714**) to equip students with essential research skills to inform and enhance product design decisions.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand the Role of Research in Design	BT1
CO2	Formulate Research Questions & Objectives	BT2
CO3	Conduct effective user research	BT3
CO4	Analyze & Interpret Data for Design Insights	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Introduction to Research in Design: What is research; Types of research.**	28	0
Unit 2	Research Planning & Problem Identification: Identifying a Design Problem; Research Processes; Literature Review & Trend Analysis.	28	0
Unit 3	User Research & Ethnographic Studies	28	0
Unit 4	Application of Research In Product Design	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.Research Design: Qualitative, Quantitative and Mixed Methods Approaches. By John W. Creswell
2.Research Methodology: Methods and Techniques. By C.R. Kothari & Gaurav Garg.

Reference Books:

1. Research Methods for Product Design. By Alex Milton & Paul Rodgers.
2. Design Research Through Practice: From the Lab, Field and Showroom. By IIpo Koskin

Paper 5 Minor Course	**Design for Sustainability** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082N711** **Level: 200**

Course Objective: The objective of **Design for Sustainability (PRD082N711**) to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Understand Sustainability in Design	BT1
CO2	Analyze and Apply Sustainable Material Choices	BT2
CO3	Integrate Sustainable Thinking into Design	BT3
CO4	Develop Sustainable Product Solutions	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Sustainable Design: Sustainability & Environmental Impact of Design; Sustainable Development Goals (SDGs) in Product Design; Circular Economy & Cradle - to- Cradle Approach.	28	0
Unit 2	Materials & Manufacturing for Sustainability: Eco-Friendly& Recycled Materials; Sustainable Manufacturing & Low-waste Production; Lifecycle Assessment.	28	0
Unit 3	Design For Longevity & Low Impact: Modular & Repairable Product Design; Design for Disassembly & Upcycling; Minimalism & Low-Impact Consumption Models	28	0
Unit 4	Biomimicry & Nature- Inspired Solutions: Biomimicry in Product Design; Energy-Efficient & Passive Design Strategies	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.Sustainable Design: A Critical Guide. By David Bergman

2. Designing for Sustainability: A Guide to Building Greener Digital Products. By Tim Frick
3.Design for Sustainability: A Step-by- Step Approach. By Jan Kuijk
4. Biomimicry: Innovation Inspired by Nature. By Janine Benyus

Reference Books:

1. Eco- Design: Integrating Environmental Aspects into Product Design. By Ernst Worrell.
2. Materials and Sustainable Development. By Michael F. Ashb

8th Semester		
Paper 1 **Major Course**	**Portfolio Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD08N812** **Level: 200**

Course Objective: The objective of **Portfolio Design (PRD082N812)** to equip students with the skills to create a professional, well-structured and visually compelling portfolio that effectively showcases their design capabilities.

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Develop a Professional Portfolio	BT1
CO2	Showcase Design Process Effectively	BT2
CO3	Develop Self-Branding & Personal Identity	BT3
CO4	Optimize Portfolio for Digital & Print Formats	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	**Understanding Design Portfolios: What is design portfolio; Case studies of successful portfolios; Analysis of portfolios from top designers and firms.**	28	0
Unit 2	Portfolio Structure & Content Development: Selecting the right projects for portfolio; How to structure portfolio; Writing effective project descriptions & case studies.	28	0
Unit 3	Visual Design & Layout Principles: Fundamentals of layout, grid systems, typography and color theory; Designing for clarity, impact and hierarchy; choosing the right format; tools & software for layout.	28	0
Unit 4	Digital & Print Portfolio Creation: Digital vs. print portfolio; Optimizing images, renderings and 3D visuals for presentation; Creating interactive PDFs & designing portfolio websites using Behance, Wix or Adobe Portfolio; Hands-on Studio	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.Portfolio Design. By Harold Linton
2.Designing a Digital Portfolio. By Cynthia L. Baron
3.How to Create a Portfolio & Get Hired: A Guide for Graphic Designers and Illustrators. By Fig Taylor.

Reference Books:

1. Behance & Beyond: How to create a winning online portfolio. By Mason Gentry.
2. Making It: Manufacturing Techniques for Product Design. By Chris Lefteri

8th Semester		
Paper 2 **Major Course**	**Mobility Design** **L-T-P-C: 1-0-6-4 Credits: 4** **Scheme of Evaluation: Theory**	**Subject Code: PRD082M812** **Level: 200**

Course Objective: The objective of **Mobility Design (PRD082M812**) to understand the evolution, trends and future of mobility in urban and industrial contexts

Course Outcome:

After successful completion of the course, student will be able to		
COs	**Course Outcome**	**Blooms Taxonomy Level**
CO1	Demonstrate Knowledge of Mobility Design & Trends	BT1
CO2	Conduct User-Centered Research & Apply Ergonomics Principles	BT2
CO3	Develop Sustainable & Smart Mobility Solutions	BT3
CO4	Apply Prototyping & Vehicle Form Development Techniques	BT4

Detailed Syllabus:

Modules	**Topics & Course Content**	**Periods/Hours**	
		L	**P**
Unit 1	Introduction to Mobility & Transportation Design: Definition & Scope of Mobility; Types of Mobility Solutions.	28	0
Unit 2	Human-Centered Mobility & User Research: Understanding Mobility Needs & Behavior; Ergonomics & Safety in Transportation; Inclusive & Accessible Mobility Design.	28	0
Unit 3	Vehicle Aesthetics, Form and Functions: Automative & Transportation Aesthetics; Aerodynamics & Structural Considerations; Color, Material and Finish (CMF) in Mobility Design.	28	0
Unit 4	Concept Development & Development & Prototyping: Sketching & Digital Rendering of Vehicles; 3D Modeling; Prototyping & Simulation Testing.	28	0
	Total	**112**	

National Credit Hours for the course: 30 x 4 = 120

Total Credits in the Paper	**Lecture/ Tutorial**	**Studio/Practical**	**Experiential Learning**
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

Textbooks:

1.The Fundamentals of Transportation Design. By Richard M. Chung.

2. Designing Mobility & Transport Systems. By Paul Nieuwenhuis.
3.Automotive Design and Development. By Tony Lewin
4. Sustainable Transportation Systems Engineering. By Francis Vanek and Louis Albright

Reference Books:

1. Mobility Design: Shaping Future Urban Transportation. By Barbara Imhof.
2. The Future of Mobility: Scenarios for Transport in 2040. By OECD.