

# SUSTAINABLE DEVELOPMENT GOALS

**17** PARTNERSHIPS  
FOR THE GOALS



## **17.4.1 University as a body have a commitment to meaningful education around the SDGs across the university**

Manav Rachna University (MRU) is strongly committed to integrating the Sustainable Development Goals (SDGs) into its curriculum, ensuring relevance across all academic programs. The entire curriculum is mapped to the 17 SDGs, and innovative teaching methods are used to engage students with sustainability topics. Students also participate in SDG-based projects, solving local challenges through project-based learning, with evaluation rubrics reflecting SDG alignment. The **Manav Rachna Centre for Peace and Sustainability (MRCPS)** plays a central role, focusing on key areas such as women empowerment, quality education, environment conservation, economic development, and peace. Through initiatives like the **Peace and Sustainability Student Club (MRPSC)**, students actively contribute to real-world SDG solutions.

### **COURSE MAPPING WITH (SDGS)**

The entire curriculum is mapped with 17 SDGs which is one of the distinctive features. It follows innovative teaching pedagogies, tweaks the curriculum as the situation demands. (The detailed mapping is given in Annexure 1)

### **ATTAINMENT OF VARIOUS UNSDGS THROUGH VARIOUS COURSES AND PEDAGOGIES.**

UN has defined 17 SDGs. The department of ECE strives to attain and implement SDGs through the courses offered and various pedagogies like project based learning, industry internships, industry collaborations etc. The details are as follows.

#### **Attainment of UN SDGs through PBL in various courses**

The department of ECE has adopted Project Based Learning in various forms.

- (a) Minor projects in laboratory courses.
- (b) Minor projects in theory along with laboratory. In case of advanced level courses this pedagogy helps the students develop strong fundamentals up to half the semester. In rest half of the semesters the students are expected to come up with a minor project in the relevant field or a combined project which utilizes the knowledge of various technical disciplines

(c) Major project in each course.

**Such pedagogy caters to UNSDG 4, 9 and 11.**

The projects can be developed catering to any other UNSDG depending upon the interest of student. Projects have been building around problems on clean water, air etc. E waste up cycling has addressed the sustainability problem with clean and healthy environment.

**ENCOURAGING STUDENTS TO WORK ON UNSDGS**

The department encourages students to take up projects related to sustainability and thus the Rubrics include few points on the choice of the Topic. The projects which can benefit the society and environment are encouraged.

**UNSDG 3** Students have taken up projects on Pocket EGG monitoring device, Prosthetic hand, Brain controlled devices etc. which cater to UNSDG 3.

**UNSDG 17** The department encourages students to work in collaboration with industries, take up industry internships, partner with students of other streams to achieve the target project objectives. This caters to UNSDG 17.

**ALIGNMENT OF PROBLEM STATEMENTS WITH UN SDGS AND SDG BASED RUBRICS**

Project Based Learning is a good pedagogy to provide learning skills, competencies , and attitude to the students to help them work towards achieving sustainable development goals.

By incorporating Project based learning into the classroom, young minds can actually be trained to think logically, investigate unsolved social problems and find the solutions by integrating science & Technology which can be a contributing factor towards achieving UN SDG Goals.

PBL also instills a global mindset as working towards UN SDGs is actually taking them ahead to solve global challenges.

Therefore, at the ideation stage only we have designed our rubrics so as to clear the expectation of teacher/mentor to the student which directs and motivates towards finding an unsolved societal problem as the problem statement to progress in their course.

Following grading criteria are used to guide and motivate the students to work towards SDG Challenges at the ideation stage.

**PBL rubrics mapping with (SDGs) (SAMPLE) (The details are given in Annexure 2)**

| <b>Stage I:- Ideation</b> |                |                       |                          |                          |                             |
|---------------------------|----------------|-----------------------|--------------------------|--------------------------|-----------------------------|
|                           | <b>Rubrics</b> | <b>Max Marks (15)</b> | <b>Needs Improvement</b> | <b>Meets Expectation</b> | <b>Exceeds Expectations</b> |

|      |                                  |       |  |   |   |
|------|----------------------------------|-------|--|---|---|
| R1.1 | Problem Statement                | 2     | The problem chosen is very common and being solved using fundamental machine learning algorithms | The problem chosen is very common and being solved using latest learning algorithms | The problem chosen is unique and less addressed and being solved using fundamental / advanced learning algorithms |
| R1.2 | Holistic Scope of Sustainability | 1     | 1<br>Project is not aligned with UN SDGs   | 1.5<br>Project is aligned with one or more UN SDGs                                  | 2   |
|      |                                  | scale | 0  | 1   |   |

|      |                     |       |   |  |  |
|------|---------------------|-------|---|--|--|
| R1.3 | Region of relevance | 1.5   | Problem is being addressed at Local Level | Problem is being addressed at national Level | Problem is being addressed at global Level |
|      |                     | scale | 0.5                                       | 1.5  | 1.5  |

### ORIENTATION ABOUT SDGS

University conducts sessions and workshops to make them aware about SDGs during orientation for students and faculties.

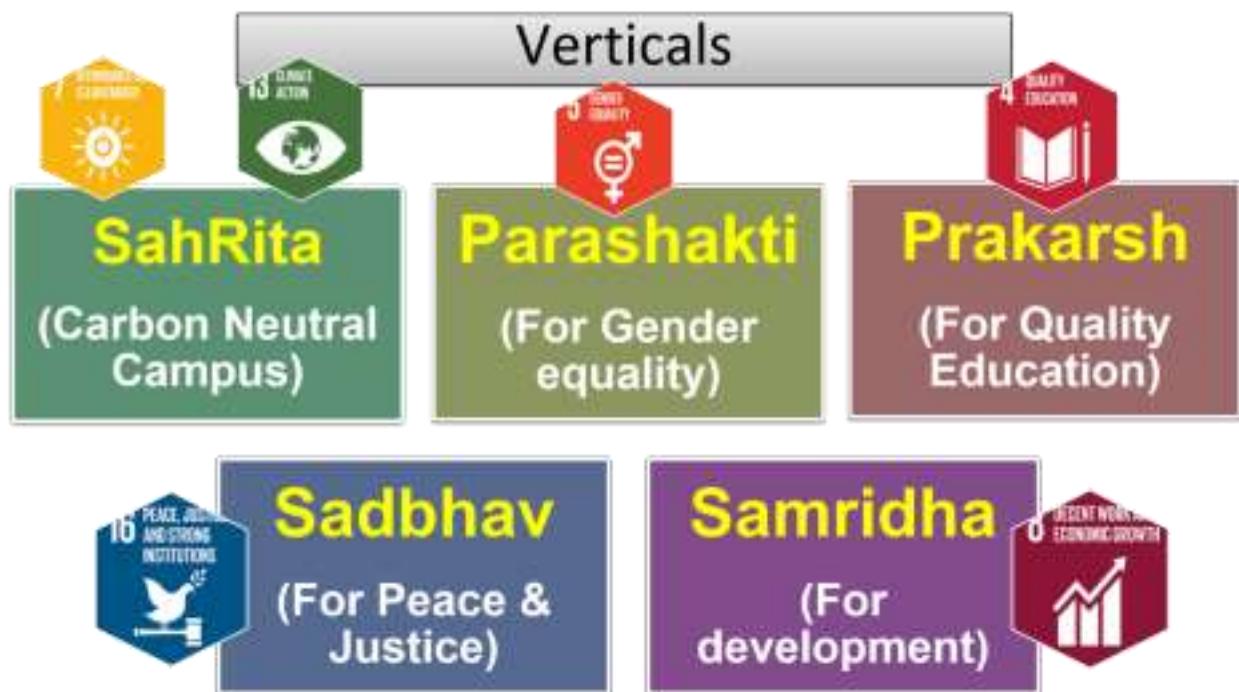
### MANAV RACHNA CENTRE FOR PEACE AND SUSTAINABILITY



Manav Rachna Centre for Peace and Sustainability (MRCPS) is deeply committed to providing meaningful education around the Sustainable Development Goals (SDGs) across the university,

and its focus is relevant and applicable to all students. MRCPS, established in 2019 under the visionary guidance of Dr. O.P. Bhalla, is a hub dedicated to promoting peace, sustainability, and social change. The center's core objectives include spreading education and training on the SDGs, fostering values of peace, sustainability, and ethics, and encouraging students to contribute to the development of sustainable communities.

MRCPS operates through five key verticals—**PARASHAKTI** (Women Empowerment), **PRAKARSH** (Quality Education), **SAHRITA** (Environment Conservation), **SAMRIDHA** (Economic Development), and **SADBHAV** (Peace)—that focus on various SDGs. These verticals specifically target education, research, training, and community outreach, with each vertical addressing specific goals such as gender equality (SDG 5), quality education (SDG 4), environmental conservation (SDG 13), economic growth (SDG 8), and promoting peace (SDG 16).



The university's initiatives, including the **Peace and Sustainability Student Club (MRPSC)**, actively engage students in practical actions related to the SDGs. Through the club, students become **Green Warriors**, **Peace Champions**, and **Gender Champions**, thereby playing a direct role in environmental conservation, promoting peace, and advocating for gender equality. This ensures that the education provided is not only theoretical but also practically applicable to real-world challenges.

Moreover, MRCPS encourages students to take part in research projects related to the SDGs and hosts awareness programs like **Project Pahal** (educating underprivileged communities), **ESDP** (SDG awareness), and **Kuch Kahna Hai** (addressing child abuse). The university's recognition through various awards, such as the **WCDM DRR Awards** and the **Institutions of Happiness** award, reflects its commitment to integrating SDGs into its educational framework and fostering a culture of peace and sustainability.

#### **SUSTAINED: EDUCATION FOR SUSTAINABLE DEVELOPMENT PROGRAMME**

- "SustainEd" Program Overview:
  - Education for Sustainable Development Program at Manav Rachna University.
  - Aims to nurture tomorrow's stewards and sustainable citizens.
- Empowering Youth:

- Focuses on the role of youth in promoting sustainability.
- Trains university students to become sustainability ambassadors.
- Holistic Approach:
  - Prepares students during their higher education journey and beyond.
  - Encourages long-term commitment to sustainability.



The audience for the project "SUSTAINED: Nurturing Future Changemakers with Sustainable Dreams and Global Goals" includes school students, university students, and, more broadly, the youth demographic. The project aims to educate and engage these young individuals in sustainable development goals and initiatives, fostering a sense of responsibility and empowerment among them to become future changemakers and advocates for global sustainability.

## **SUSTAINABILITY WALL**



MRCPS stands as a strong advocate for incorporating SDGs into university education, making it not only relevant but essential for all students. It creates a space where students are

empowered to take action towards sustainable development while aligning their academic pursuits with global goals for peace, equity, and environmental stewardship.

## Department of Electronics and Communication Engineering

### Attainment of various UNSDGs through various Courses and Pedagogies

UN has defined 17 SDGs. The department of ECE strives to attain and implement SDGs through the courses offered and various pedagogies like project based learning, industry internships, industry collaborations etc. The details are as follows.

#### Course mapping with (SDGs)

| Semester 3      |                                   |   |   |  |
|-----------------|-----------------------------------|---|---|--|
| Program         | Course                            | Integrated SDG                          |   | Topics   |
| B.Tech<br>(ECE) | Introduction<br>to Research       | SDG9                                    | SDG11                                   | What is Research and its impact<br>Capturing the current research<br>trends<br>Insight about scientific research<br>performed by renowned experts in<br>the related field(casDo's and<br>Don'ts pertaining to research |
| B.Tech<br>(ECE) | Electronic<br>Design<br>Workshop  | SDG9                                    | SDG3,<br>SDG 11                         | Projects in healthcare and clean<br>environment.   |
| B.Tech<br>(ECE) | Electronic<br>Waste<br>Management | SDG 12,<br>SDG 13,<br>SDG 14,<br>SDG 15 | SDG 12,<br>SDG 13,<br>SDG 14,<br>SDG 15 | Impact of increasing E-waste in air,<br>land and water pollution and life,<br>Methods to reduce them , health<br>hazards due to e-waste etc  |

| Semester 4   |                                 |                |       |   |
|--------------|---------------------------------|----------------|-------|---|
| Program      | Course                          | Integrated SDG |       | Topics  |
| B.Tech (ECE) | Innovation<br>and<br>Research-I | SDG9           | SDG11 | Collection of research papers<br>related to previously identified<br>gap/problem.<br>Comprehend and arrange the<br>literature based on the idea,<br>Presenting the collected data and<br>inferring it with the further scope<br>of expansion and Designing the<br>experiment wherever applicable. |

| Semester 5   |                            |                |       |  |
|--------------|----------------------------|----------------|-------|--|
| Program      | Course                     | Integrated SDG |       | Topics   |
| B.Tech (ECE) | IOT Networks and Protocols | SDG3           | SDG9  | Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints Introduction, Technical Design constraints-hardware   |
| B.Tech (ECE) | Digital Signal Processing  | SDG9           | SDG11 | applications of digital filter design, introduction to speech processing, image processing   |
| B.Tech (ECE) | Innovation and Research-II | SDG9           | SDG11 | Conduct experiments/ build prototype Tabulating and recording Analysis and interpretation of the data Comparison of the results with other reported experiments Interpretation of observations |

## 2. Attainment of UN SDGs through PBL in various courses

The department of ECE has adopted Project Based Learning in various forms.

(a) Minor projects in laboratory courses.

(b) Minor projects in theory along with laboratory. In case of advanced level courses this pedagogy helps the students develop strong fundamentals up to half the semester. In rest half of the semesters the students are expected to come up with a minor project in the relevant field or a combined project which utilizes the knowledge of various technical disciplines

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### Such pedagogy caters to UNSDG 4, 9 and 11.

The projects can be developed catering to any other UNSDG depending upon the interest of student. Projects have been building around problems on clean water, air etc. E waste up cycling has addressed the sustainability problem with clean and healthy environment. **3.**

### Encouraging students to work on UNSDGs

The department encourages students to take up projects related to sustainability and thus the Rubrics include few points on the choice of the Topic. The projects which can benefit the society and environment are encouraged.

4. **UNSDG 3** Students have taken up projects on Pocket EGG monitoring device, Prosthetic hand, Brain controlled devices etc. which cater to UNSDG 3.

5. **UNSDG 17** The department encourages students to work in collaboration with industries, take up industry internships, partner with students of other streams to achieve the target project objectives. This caters to UNSDG 17.

## Department of Mechanical Engineering

### Attainment of various UNSDGs through various Courses and Pedagogies

| <b>Semester1</b>       |  |                       |       |  |
|------------------------|--|-----------------------|-------|--|
| <b>Program</b>         | <b>Course</b>                                  | <b>Integrated SDG</b> |       | <b>Topics</b>  |
| <b>B.TECH<br/>(ME)</b> | Basics of Electronics & Electrical Engineering | SDG7                  | SDG11 | Digital electrics, Energy efficient circuits,  |
| <b>B.TECH<br/>(ME)</b> | Constitution of India                          | SDG11                 | SDG16 | All about Indian constitutions and human rights  |
| <b>Semester2</b>       |  |                       |       |  |
| <b>Program</b>         | <b>Course</b>                                  | <b>Integrated SDG</b> |       | <b>Topics</b>  |
| <b>B.TECH<br/>(ME)</b> | Environmental Science                          | SDG13                 | SDG11 | Renewable and Non-Renewable Resources, Ecosystems, Biodiversity and its conservation, Environmental Pollution  |
| <b>Semester3</b>       |  |                       |       |  |
| <b>Program</b>         | <b>Course</b>                                  | <b>Integrated SDG</b> |       | <b>Topics</b>  |
| <b>B.TECH<br/>(ME)</b> | Introduction To Research                       | SDG9                  | SDG11 | What is Research and its impact, Capturing the current research trends , Insight about scientific research performed by renowned experts in the related field  |
| <b>Semester4</b>       |  |                       |       |  |
| <b>Program</b>         | <b>Course</b>                                  | <b>Integrated SDG</b> |       | <b>Topics</b>  |
| <b>B.TECH<br/>(ME)</b> | Research Innovation-I                          | SDG9                  | SDG11 | Collection of research papers related to previously identified gap/problem Comprehend and arrange the literature based on the idea, Presenting the collected data and inferring it with the further scope of expansion and Designing the experiment wherever applicable. |
| <b>Semester5</b>       |  |                       |       |  |

| Program                | Course      | Integrated SDG |      | Topics   |
|------------------------|-------------|----------------|------|--|
| <b>B.TECH<br/>(ME)</b> | 3D Printing | SDG9           | SDG9 | Additive Manufacturing,<br>Innovation in Manufacturing<br>Industry |

|                        |  |       |       |  |
|------------------------|--|-------|-------|--|
| <b>B.TECH<br/>(ME)</b> | Environmental Ethics & Sustainable Development | SDG13 | SDG15 | Challenges to Sustainable Development and Sustainable Development Goals, Sustainability Strategies & Reporting, Sustainable Development and Contemporary Issues  |
| <b>B.TECH<br/>(ME)</b> | Green Computing                                | SDG13 | SDG15 | E-Waste Legislation, End of Life Management of E-Waste, Environmentally Sound E-Waste Management   |
| <b>B.TECH<br/>(ME)</b> | E-Waste Management                             | SDG13 | SDG15 | Minimizing Power Usage, Green Data Centers, Greening Your Information Systems  |
| <b>B.TECH<br/>(ME)</b> | Essence of Indian Traditional Knowledge        | SDG11 | SDG16 | fundamental to protecting and promoting indigenous peoples' cultures and identities  |
| <b>B.TECH<br/>(ME)</b> | Research Innovation-II                         | SDG9  | SDG11 | Conduct experiments/ build prototype Tabulating and recording Analysis and interpretation of the data.<br>Comparison of the results with other reported experiments.<br>Interpretation of observations |

#### Semester 7

| Program                | Course                                    | Integrated SDG |       | Topics   |
|------------------------|---|----------------|-------|--|
| <b>B.TECH<br/>(ME)</b> | Renewable Energy Sources                  | SDG7           | SDG13 | Solar Energy, Wind Energy, Biomass Energy, Geothermal Energy, Wave Energy, MHD and Fuel Cell |
| <b>B.TECH<br/>(ME)</b> | Heating, Ventilation and Air Conditioning | SDG7           | SDG13 | Heat load calculation, ventilation, Air conditioning, human comfort, etc.                    |

|                        |                                  |      |       |   |
|------------------------|----------------------------------|------|-------|---|
| <b>B.TECH<br/>(ME)</b> | Entrepreneurship                 | SDG9 | SDG17 | The new business opportunities have encouraged entrepreneurship on a grand scale. Children are constantly practicing entrepreneurship |
| <b>B.TECH<br/>(ME)</b> | Energy Conservation & management | SDG7 | SDG13 | Energy conservation, energy audits, economics etc.  |

|                        |                    |                       |       |  |
|------------------------|--------------------|-----------------------|-------|--|
| <b>B.TECH<br/>(ME)</b> | Applied Philosophy | SDG10                 | SDG16 | Human Rights And Laws                            |
| <b>B.TECH<br/>(ME)</b> | Applied Psychology | SDG16                 |       | Introduction to Psychology, Psychological Abuse  |
| <b>B.TECH<br/>(ME)</b> | Applied Sociology  | SDG8                  | SDG10 | Social change & mobility                         |
| <b>Semester8</b>       |                    |                       |       |  |
| <b>Program</b>         | <b>Course</b>      | <b>Integrated SDG</b> |       | <b>Topics</b>                                    |
| <b>B.TECH<br/>(ME)</b> | Project            | SDG3                  | SDG8  | Solar Power, Composites, Electric Vehicles, etc. |

**Semester 1**

| <b>Program</b>   | <b>Course</b>                                      | <b>Integrated SDG</b> |       | <b>Topics</b>   |
|--|--|-----------------------|-------|---|
| <b>B.Tech<br/>Computer<br/>Science &amp;<br/>Engineering</b> | ENVIRONMENTAL STUDIES                              | SDG1<br>3             | SDG11 | Renewable and<br>Non-Renewable<br>Resources,<br>Ecosystems<br>Biodiversity and its<br>conservation,<br>Environmental<br>Pollution |
|  | USER INTERFACE-I<br>(HTML5,CSS,JAVASCRIPT,JQUERY)  |                       | SDG11 | website designing<br>and development<br>using HTML, CSS<br>and Javascript   |
|  | OVERVIEW OF DATA SCIENCE &MACHINE<br>LEARNING      |                       | SDG11 | Machine Learning<br>overview,<br>Automation,<br>Intelligent System, AI  |
|  | DIGITAL PRODUCT<br>ENGINEERING AND DESIGN THINKING |                       | SDG11 | Design Thinking,<br>Product Development   |
|  | INTRODUCTION TO<br>INFORMATION SECURITY            |                       | SDG11 | Smart City,<br>Sustainable<br>Development   |

**B.TECH Computer Science & Engineering****Course mapping with (SDGs)**

| Semester 2  |   |                |           |  |
|---|---|----------------|-----------|--|
| Program   | Course  | Integrated SDG |           | Topics   |
| <b>B.Tech. Computer Science &amp; Engineering</b> | CLOUD COMPUTING   | SDG1<br>2      | SDG11     | Virtualization, Virtual Machines, Load Scheduling, Task scheduling, resource management] |
|   | BASICS OF ELECTRONICS & ELECTRICAL ENGINEERING                    | SDG7           | SDG1<br>1 | Digital electrics, Energy efficient circuits   |
|   | UNIVERSAL HUMAN VALUES  | SDG1<br>6      | SDG3      | Peace, Sustainability, Love  |
|   | AGILE SOFTWARE DEVELOPMENT  | SDG9           | SDG1<br>1 | energy efficient Software engineering  |
|   | PYTHON PROGRAMMING  | SDG9           | SDG1<br>2 | Lightweight, energy efficient programming language                                       |
|   | INTRODUCTION TO STANDARDS, FRAMEWORKS AND KEY TECHNOLOGY CONCEPTS | SDG9           | SDG1<br>1 | Smart City, Sustainable Development  |

| Semester 3  |                                 |                |           |   |
|---|---------------------------------|----------------|-----------|---|
| Program   | Course                          | Integrated SDG |           | Topics  |
| <b>B.Tech. Computer Science &amp; Engineering</b> | INTRODUCTION TO RESEARCH        | SDG<br>3       | SDG<br>6  | Carbon Footprint, Innovation in Health care, Use of IOT for social well being |
|   | ANALYSIS & DESIGN OF ALGORITHMS | SDG<br>9       | SDG<br>12 | Energy efficient and cost effective software designing                        |

|  |  |           |           |  |
|--|--|-----------|-----------|--|
|  | USER INTERFACE-II<br>(MONGODB, TYPESCRIPT, ANGULAR JS)   | SDG<br>9  | SDG<br>11 | Web designing and web development  |
|  | SUPERVISED LEARNING                                      | SDG<br>9  | SDG<br>11 | Machine learning algorithms and techniques to achieve sustainable computing          |
|  | APP.<br>PHILOSOPHY/APP.<br>PSYCHOLOGY/ APP.<br>SOCIOLOGY | SDG<br>16 | SDG<br>1  | Study of mental functions and behaviors to help support peace and harmony in society |
|  | DATA STRUCTURES<br>& ALGORITHMS                          | SDG<br>9  | SDG<br>11 | Study and design of algorithms to support innovation and research                    |
|  | <b>B.Tech Computer Science &amp; Engineering</b>         | SDG<br>9  | SDG<br>12 | Learn database management scheme in energy and cost effective way                    |
|  | SOFTWARE CRAFTMANSHIP                                    | SDG<br>11 | SDG<br>12 | Designing software to support sustainable development                                |
|  | SECURE CODING IN C/C++                                   | SDG<br>11 | SDG<br>12 | Making the systems secure from theft and hacking                                     |
|  | INTRODUCTION TO RESEARCH                                 | SDG<br>9  | SDG<br>11 | Innovation and research related to achieve sustainable development                   |

| Semester 4  |   |                |       |  |
|---|---|----------------|-------|--|
| Program   | Course                                  | Integrated SDG |       | Topics   |
| <b>B.Tech. Computer Science &amp; Engineering</b> | ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE | SDG4           | SDG16 | Fundamental to protecting and promoting indigenous |

|  |  |  |  |          |
|--|--|--|--|----------|
|  |  |  |  | peoples' |
|--|--|--|--|----------|

|  |  |      |       |   |
|--|--|------|-------|---|
|  |  |      |       | cultures and identities   |
|  | OPERATING SYSTEM                             | SDG9 | SDG12 | Learning and exploring a software programme required to manage and operate a computing device, and making it energy efficient |
|  | PROGRAMMING FOR PROBLEM SOLVING USING PYTHON | SDG9 | SDG11 | Lightweight, energy efficient programming language  |
|  | COMPUTER ARCHITECTURE & ORGANIZATION         | SDG9 | SDG12 | Internal computer programming and hardware networking   |

|  |   |           |       |  |
|--|---|-----------|-------|--|
|  | UNSUPERVISED LEARNING<br>& NEURAL NETWORK | SDG9      | SDG11 | Training of a machine using information that is neither classified nor labeled in order to make it work in an efficient way that will help to make work of mankind more easy and efficient |
|  | INDIAN CONSTITUTION                       | SDG1<br>1 | SDG16 | All about Indian constitutions and human rights  |

|  |                                  |      |       |  |
|--|----------------------------------|------|-------|--|
|  | COMPUTER NETWORKS                | SDG9 | SDG12 | Learning energy efficient network design                             |
|  | MODERN WEB AND MOBILE FRAMEWORKS | SDG9 | SDG12 | Making energy efficient mobile frameworks to reduce carbon emissions |

|  |  |           |                       |   |
|--|--|-----------|-----------------------|---|
|  | DIGITAL FORENSICS                                      | SDG9      | SDG12                 | Electronic evidence is a component of almost all criminal activities and digital forensics support is crucial for law enforcement investigations. |
|  | USER INTERFACE-II<br>(MONGODB, TYPESCRIPT, ANGULAR JS) | SDG9      | SDG11                 | Website designing and development using HTML, CSS and JavaScript  |
|  | INDIAN CONSTITUTION                                    | SDG1<br>1 | SDG16                 | All about Indian constitutions and human rights   |
|  | ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE                | SDG1<br>1 | SDG16<br>Institutions | Fundamental to protecting and promoting indigenous peoples' cultures and identities   |

|  |                  |      |       |   |
|--|------------------|------|-------|---|
|  | ENTREPRENEURSHIP | SDG9 | SDG11 | The new business opportunities have encouraged entrepreneurship on a grand scale. Children are constantly practicing entrepreneurship |
|--|------------------|------|-------|---|

| Semester 5  |   |                |       |   |
|---|---|----------------|-------|---|
| Program   | Course  | Integrated SDG |       | Topics  |
| <b>B.Tech. Computer Science &amp; Engineering</b> | ENVIRONMENTAL ETHICS & SUSTAINABLE DEVELOPMENT/ GREEN COMPUTING/ E-WASTE MANAGEMENT | SDG13          | SDG15 | Challenges to Sustainable Development and Sustainable Development Goals, Sustainability Strategies & Reporting, Sustainable Development and Contemporary Issues/ E-WASTE LEGISLATION , END OF LIFE MANAGEMENT OF E-WASTE, ENVIRONMENTALLY SOUND E-WASTE MANAGEMENT, / Minimizing Power Usage, Green Data Centers, Greening Your Information Systems |
|   | CYBER LAW/ LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS                             | SDG16          | SDG10 | Computer and its impact in society, Privacy Issues & Access Rights, Cybercrimes and Legal framework, Information and Technology Act & Intellectual Property Rights/ Protection of Copyright, Traditional  |

|  |                                       |      |       |   |
|--|---------------------------------------|------|-------|---|
|  |                                       |      |       | Knowledge, Design and Integrated Circuits, Law relating to Patents, IT Law and Cyber Offences and other IPRs  |
|  | RESEARCH & INNOVATION-I I             | SDG3 | SDG4  | Carbon Footprint, Innovation in Health care, Use of IOT for social well being   |
|  | DIGITAL ELECTRONICS & MICROCONTROLLER | SDG9 | SDG11 | Basics of Microprocessor and 8051 Microcontroller   |
|  | ANALYSIS & DESIGN OF ALGORITHMS       | SDG9 | SDG11 | Energy efficient and cost effective software designing  |
|  | ADVANCED NEURAL NETWORK               | SDG9 | SDG11 | Role of ML in Education, Healthcare, Enterprise, Online and Distributed Learning  |
|  | ADVANCED JAVA                         | SDG9 | SDG12 | Provides libraries to understand the concept of Client-Server architecture for web-based applications. We can also work with web and application servers such as Apache Tomcat and Glassfish Using these servers, we can understand the working of HTTP protocol. |

|  |   |  |   |   |
|--|---|--|---|---|
|  | CYBER LAW/ LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS | SDG11 Sustainable Cities and Communities | SDG16 Peace and Justice Strong Institutions | Computer and its impact in society, Privacy Issues & Access Rights, Cybercrimes and Legal framework, Information and Technology Act & Intellectual Property Rights/ Protection of Copyright, Traditional Knowledge, Design and Integrated Circuits, Law relating to Patents, IT Law and Cyber Offences and other IPRs |
|--|---|--|---|---|

|  |   |      |       |   |
|--|---|------|-------|---|
|  | ENVIRONMENTAL ETHICS & SUSTAINABLE DEVELOPMENT/ GREEN COMPUTING /E-WASTE MANAGEMENT | SDG3 | SDG11 | Design and opting practices that supports sustainable computing and sustainable development   |
|  | RESEARCH & INNOVATION-II  | SDG9 | SDG12 | Carbon Footprint, Innovation in Health care, Use of IOT for social well being   |
|  | DEVOPS AND TEST AUTOMATION  | SDG9 | SDG12 | Using test automation, DevOps can: Use test cases to detect bugs and save time. Unlike manual testing, automatic test cases make testing faster, which means you can deploy products to market more quickly. Use software programs to test applications and minimize the chance of human error. |

|  |                                      |      |       |  |
|--|--------------------------------------|------|-------|--|
|  | THEORY OF AUTOMATA & COMPILER DESIGN | SDG9 | SDG11 | Designing of effective machines  |
|  | ADVANCED JAVA                        | SDG9 | SDG12 | Provides libraries to understand the concept of Client-Server architecture for web- based applications. We can also work with web and application servers such as Apache Tomcat and Glassfish Using these servers, we can understand the working of HTTP protocol. |

|  |   |      |       |   |
|--|---|------|-------|---|
|  | ENVIRONMENTAL ETHICS & SUSTAINABLE DEVELOPMENT/ GREEN COMPUTING/ E-WASTE MANAGEMENT | SDG3 | SDG11 | Challenges to Sustainable Development and Sustainable Development Goals, Sustainability Strategies & Reporting, Sustainable Development and Contemporary Issues/ E-WASTE LEGISLATION , END OF LIFE MANAGEMENT OF E-WASTE, ENVIRONMENTALLY SOUND E-WASTE MANAGEMENT, / Minimizing Power Usage, Green Data Centers, Greening Your Information Systems |
|--|---|------|-------|---|

|  |  |       |       |   |
|--|--|-------|-------|---|
|  | CYBER LAW/LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS | SDG16 | SDG9  | Computer and its impact in society, Privacy Issues & Access Rights, Cybercrimes and Legal framework, Information and Technology Act & Intellectual Property Rights/ Protection of Copyright, Traditional Knowledge, Design and Integrated Circuits, Law relating to Patents, IT Law and Cyber Offences and other IPRs |
|  | RESEARCH & INNOVATION-I I                              | SDG9  | SDG11 | Carbon Footprint, Innovation in Health care, Use of IOT for social well being   |
|  | NETWORK SECURITY                                       | SDG9  | SDG11 | Network security is important for home networks as well as in the business world. Most homes with high-speed internet connections have one or more wireless routers, which could be exploited if not properly secured. A solid network security system helps reduce   |

|  |                                       |      |       |  |
|--|---------------------------------------|------|-------|--|
|  |                                       |      |       | the risk of data loss, theft and sabotage. |
|  | THEORY OF AUTOMATA & COMPILER DESIGN  | SDG9 | SDG11 | Designing of effective machines            |
|  | DIGITAL ELECTRONICS & MICROCONTROLLER | SDG9 | SDG11 | Development of Electronic Products         |

|  |   |       |       |   |
|--|---|-------|-------|---|
|  | DATA WAREHOUSE & DATA MINING  | SDG9  | SDG12 | Designing of Effective Database management  |
|  | MACHINE LEARNING  | SDG9  | SDG12 | Role of ML in Education, Healthcare, Enterprise, Online and Distributed Learning  |
|  | ENVIRONMENTAL ETHICS & SUSTAINABLE DEVELOPMENT/ E-WASTE MANAGEMENT/ GREEN COMPUTING | SDG9  | SDG11 | Challenges to Sustainable Development and Sustainable Development Goals, Sustainability Strategies & Reporting, Sustainable Development and Contemporary Issues/ E-WASTE LEGISLATION , END OF LIFE MANAGEMENT OF E-WASTE, ENVIRONMENTALLY SOUND E-WASTE MANAGEMENT, / Minimizing Power Usage, Green Data Centers, Greening Your Information Systems |
|  | RESEARCH & INNOVATION-II  | SDG9  | SDG12 | Carbon Footprint, Innovation in Health care, Use of IOT for social well being   |
|  | UNIVERSAL HUMAN VALUES  | SDG16 | SDG3  | Peace, Sustainability, Love   |

| Semester 6                             |                  |                |      |   |
|--|------------------|----------------|------|---|
| Program                                | Course           | Integrated SDG |      | Topics  |
| B.Tech. Computer Science & Engineering | MACHINE LEARNING | SDG3           | SDG9 | Role of ML in Education, Healthcare, Enterprise, Online and Distributed |

|  |                                      |      |       |   |
|--|--------------------------------------|------|-------|---|
|  |                                      |      |       | Learning  |
|  | COMPUTER GRAPHICS & MULTIMEDIA       | SDG9 | SDG12 | Pictures and films created using computers. Multimedia is content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content |
|  | THEORY OF AUTOMATA & COMPILER DESIGN | SDG9 | SDG11 | Designing of effective machines   |
|  | ADVANCED ANDROID DEVELOPMENT         | SDG9 | SDG12 | Making energy efficient mobile frameworks to reduce carbon emissions  |
|  | N/W SECURITY & CRYPTOGRAPHY          | SDG9 | SDG12 | Designing of effective network Security   |
|  | OBJECT ORIENTED SOFTWARE ENGINEERING | SDG9 | SDG12 | Designing software to support sustainable development   |

|  |  |      |       |                                       |
|--|--|------|-------|---------------------------------------|
|  | ELECTRONIC DESIGN WORKSHOP/ 3-D SOFTWARE/ AGILE TECHNOLOGIES | SDG9 | SDG12 | Energy efficient Software engineering |
|--|--|------|-------|---------------------------------------|

|  |  |      |       |  |
|--|--|------|-------|--|
|  | SENSORS & IOT/<br>3 D<br>PRINTING/ R<br>PROGRAMMI<br>NG            | SDG9 | SDG12 | IOT sensors and sustainable computing                                |
|  | SOFTWARE ENGINEERING.  | SDG9 | SDG11 | Energy efficient Software engineering                                |
|  | COMPUTER NETWORKS  | SDG9 | SDG11 | Designing of energy efficient Networks                               |
|  | NATURAL LANGUAGE PROCESSING  | SDG9 | SDG11 | Helps machine understand human language                              |
|  | MOBILE COMPUTING WITH ANDROID                                      | SDG9 | SDG11 | Making energy efficient mobile frameworks to reduce carbon emissions |
|  | SYSTEM NETWORK & ADMINISTRATION                                    | SDG9 | SDG11 | Making the systems secure  |
|  | ELECTRONIC DESIGN WORKSHOP/<br>3-D Software/<br>AGILE TECHNOLOGIES | SDG9 | SDG12 | energy efficient Software engineering                                |
|  | SENSORS & IOT/<br>3 D PRINTING/                                    | SDG9 | SDG12 | IOT sensors and sustainable computing                                |

|  |                      |  |  |  |
|--|----------------------|--|--|--|
|  | R<br>PROGRAMMI<br>NG |  |  |  |
|--|----------------------|--|--|--|

|  |      |       |  |
|--|------|-------|--|
| MODERN ARCHITECTURE PATTERNS                                       | SDG9 | SDG11 | Modern-Day Architecture Design Patterns for Software Professionals · Circuit Breaker · Command and Query Responsibility Segregation (CQRS) |
| SOFTWARE ENGINEERING.  | SDG9 | SDG11 | Sustainable software development   |
| USER EXPERIENCE  | SDG9 | SDG11 | Creating softwares that can support all facet of life.<br>Creating websites and software interfaces to help support the eay functionality  |
| ELECTRONIC DESIGN WORKSHOP/<br>3-D Software/<br>AGILE TECHNOLOGIES | SDG9 | SDG12 | The IoT and its counterpart, the Industrial Internet of Things (IIoT), are bringing sensor usage to a new level.                           |
| SENSORS & IOT/<br>3 D Printing/<br>PROGRAMMING                     | SDG9 | SDG12 | The IoT and its counterpart, the Industrial Internet of Things (IIoT), are bringing sensor usage to a new level.                           |
| VULNERABILITY ASSESSMENT AND PENETRATION TESTING                   | SDG9 | SDG12 | Market analysis, evaluation factors, vendor strengths and weaknesses, and more. Get a complimentary copy of the report now.                |
| CLOUD COMPUTING  | SDG9 | SDG12 | Virtualization, Virtual Machines, Load Scheduling, Task scheduling, resource management]   |
| ADVANCED JAVA  | SDG9 | SDG12 | provides libraries to understand the concept of Client-Server architecture for web- based applications. We                                 |

|  |  |      |       |   |
|--|--|------|-------|---|
|  |  |      |       | can also work with web and application servers such as Apache Tomcat and Glassfish Using these servers, we can understand the working of HTTP protocol. |
|  | ADVANCED ANDROID DEVELOPMENT                                       | SDG9 | SDG12 | Making energy efficient mobile frameworks to reduce carbon emissions  |
|  | N/W SECURITY & CRYPTOGRAPHY  | SDG9 | SDG12 | Designing of effective network Security   |
|  | SOFTWARE TESTING   | SDG9 | SDG12 | The act of examining the artifacts and the behavior of the software under test by validation and verification   |
|  | USER EXPERIENCE  | SDG9 | SDG12 | Creating software that can support all facet of life.<br>Creating websites and software interfaces to help support the eay functionality                |
|  | ELECTRONIC DESIGN WORKSHOP/<br>3-D SOFTWARE/<br>AGILE TECHNOLOGIES | SDG9 | SDG12 | Innovation and research realated to achieve sustainable developemnt   |

|  |  |      |       |  |
|--|--|------|-------|--|
|  | CYBER LAW/<br>LAW<br>RELATING<br>TO<br>INTELLECTU<br>A L<br>PROPERTY<br>RIGHTS | SDG9 | SDG16 | Computer and its impact<br>in society, Privacy Issues<br>& Access Rights,<br>Cybercrimes and Legal<br>framework,<br>Information and<br>Technology Act &<br>Intellectual Property<br>Rights/ Protection of<br>Copyright, Traditional<br>Knowledge, Design and<br>Integrated Circuits, Law<br>relating to Patents, IT<br>Law |
|--|--|------|-------|--|

|  |  |  |  |                                      |
|--|--|--|--|--------------------------------------|
|  |  |  |  | and Cyber Offences and<br>other IPRs |
|--|--|--|--|--------------------------------------|

| Semester7   |   |                   |           |  |
|---|---|-------------------|-----------|--|
| Program   | Course  | Integrated<br>SDG |           | Topics   |
| <b>B.Tech.<br/>Computer<br/>Science &amp;<br/>Engineer<br/>in g</b> | INTRODUCTION<br>TO FINANCE/<br>BASICS OF<br>ECONOMICS/ESSENTI<br>A L OF<br>PEACE &<br>SUSTAINBILITY | SDG1<br>6         | SDG1<br>1 | Understanding peace<br>from different<br>perspective: Self, Local<br>Community, National and<br>Global.<br>, Concept of<br>Sustainability and<br>Sustainable<br>Development Goals<br>(2030) as drivers of<br>sustainable, health and<br>social initiatives |
|   | INDIAN CONSTITUTION   | SDG1<br>6         | SDG5      | The Directive Principles<br>of State Policy – Its<br>importance and<br>implementation, Local<br>Self Government –<br>Constitutional Scheme in<br>India, The scheme of the<br>Fundamental Duties and<br>its legal status                                    |

|  |                  |      |           |   |
|--|------------------|------|-----------|---|
|  | BIG DATA         | SDG9 | SDG1<br>2 | Field that treats ways to analyze, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software |
|  | SOFTWARE TESTING | SDG9 | SDG1<br>2 | The act of examining the artifacts and the behavior of the software under test by validation and verification   |

|  |                                      |      |           |  |
|--|--------------------------------------|------|-----------|--|
|  | COMPUTER VISION & DATA VISUALIZATION | SDG9 | SDG1<br>2 | Graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data. |
|  | THEORY OF AUTOMATA & COMPILER DESIGN | SDG9 | SDG1<br>1 | Designing of effective machines  |
|  | COMPUTER GRAPHICS & MULTIMEDIA       | SDG9 | SDG1<br>1 | Pictures and films created using computers. Multimedia is content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content                                |

|  |  |      |           |  |
|--|--|------|-----------|--|
|  | WIRELESS SENSOR NETWORK/<br>OPERATION RESEARCH BY OPTIMISING TECHNIQUE/<br>INFORMATION RETRIEVAL | SDG9 | SDG1<br>1 | Refer to networks of spatially dispersed and dedicated sensors that monitor and record the physical conditions of the environment and forward the collected data to a central location.                                  |
|  | VIRTUALIZATION -<br>CONTAINERS/CLOUD   | SDG9 | SDG1<br>1 | Sustainable energy efficient techniques for processing and provisioning  |
|  | CONTINUOUS INTEGRATION<br>AND<br>CONTINUOUS DELIVERY   | SDG9 | SDG1<br>1 | Sustainable solutions:<br>Continuous integration is a software development practice where members of a team use a version control system and frequently integrate their work to the same location, such as a main branch |
|  | ARTIFICIAL INTELLIGENCE  | SDG9 | SDG1<br>1 | Legal text classification, Natural Language  |

|  |                              |      |           |   |
|--|------------------------------|------|-----------|---|
|  |                              |      |           | Understanding and Deep Learning   |
|  | ADVANCED ANDROID DEVELOPMENT | SDG9 | SDG1<br>1 | Making energy efficient mobile frameworks to reduce carbon emissions  |
|  | N/W SECURITY & CRYPTOGRAPHY  | SDG9 | SDG1<br>2 | Designing of effective network Security   |
|  | SOFTWARE TESTING             | SDG9 | SDG1<br>2 | The act of examining the artifacts and the behavior of the software under test by validation and verification |

|  |  |      |           |  |
|--|--|------|-----------|--|
|  | .NET                                     | SDG9 | SDG1<br>1 | Creating software that can support all facet of life. Creating websites and software interfaces to help support the easy functionality   |
|  | MALWARE ANALYSIS AND REVERSE ENGINEERING | SDG9 | SDG1<br>2 | More advanced malware analysis is a manual process in which malware samples are used in reverse engineering, often using a range of different tools. Through reverse engineering, researchers are able to detect hidden functions of a particular malware, even those that are only performed under certain conditions |
|  | INTERNET OF THINGS                       | SDG9 | SDG1<br>2 | The IoT and its counterpart, the Industrial Internet of Things (IIoT), are bringing sensor usage to a new level.   |
|  | MOBILE APP. ANALYTICS                    | SDG9 | SDG1<br>2 | Development of applications  |
|  | SOFTWARE PROJECT MANAGEMENT              | SDG9 | SDG1<br>2 | Software project management is an art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are   |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  | planned, implemented, monitored and controlled |
|--|--|--|--|--|

|  |  |      |           |   |
|--|--|------|-----------|---|
|  | CLOUD SECURITY                             | SDG9 | SDG1<br>2 | the protection of data stored online via cloud computing platforms from theft, leakage, and deletion.   |
|  | WIRELESS SENSOR NETWORK                    | SDG9 | SDG1<br>2 | Refer to networks of spatially dispersed and dedicated sensors that monitor and record the physical conditions of the environment and forward the collected data to a central location.   |
|  | OPERATION RESEARCH BY OPTIMISING TECHNIQUE | SDG9 | SDG1<br>2 | <p>Research in optimization involves the analysis of such mathematical problems and the design of efficient algorithms for solving them. ...</p> <p>Optimization technologies provide examples of how deep mathematical techniques help to provide concrete computational tools for solving a diverse suite of problems</p> |
|  | INFORMATION RETRIEVAL                      | SDG9 | SDG1<br>2 | Information retrieval in computing and information science is the process of obtaining information system resources that are relevant to an information need from a collection of those resources. Searches can be based on full-text or other content-based indexing.  |

| Semester 8 |        |                |        |
|------------|--------|----------------|--------|
| Program    | Course | Integrated SDG | Topics |

|   |  |       |       |  |
|---|--|-------|-------|--|
| <b>B.Tech.<br/>Computer<br/>Science &amp;<br/>Engineer<br/>in g</b> | CONVOLUTIONAL<br>NEURAL NETWORK<br>FOR VISUAL<br>RECOGNITION | SDG3  | SDG4  | Deep Learning<br>Software, CNN<br>Architectures,<br>Recurrent<br>Neural<br>Networks,<br>Detection and<br>Segmentation,<br>Visualizing and<br>Understanding   |
|   | APP.<br>PHILOSOPHY/APP.<br>PSYCHOLOGY/ APP.<br>SOCIOLOGY     | SDG11 | SDG16 | Different<br>philosophical<br>doctrines  |
|   | BUSINESS<br>INTELLIGENCE &<br>ANALYTICS WITH R               | SDG11 | SDG8  | Analysis and<br>forecasting, the<br>strategies and<br>technologies<br>used by<br>enterprises for<br>the data<br>analysis and<br>management of<br>business<br>information.  |
|   | SOFTWARE<br>REQUIREMENT<br>ENGINEERING                       | SDG9  | SDG12 | Before any of<br>the actual<br>designing,<br>coding, testing,<br>or<br>maintenance<br>takes place. The<br>goal is to create<br>an<br>important early<br>document and<br>process in the<br>software design<br>for gathering<br>requirements |
|   | MOBILE APP.<br>ANALYTICS                                     | SDG9  | SDG11 | IMPLEMENTIN<br>G MOBILE<br>TOOLS, In-app<br>analytics<br>describes<br>everything a<br>user does  |

|  |                |      |       |  |
|--|----------------|------|-------|--|
|  |                |      |       | within an application                          |
|  | CLOUD SECURITY | SDG9 | SDG11 | The protection of data stored online via cloud |

|  |   |      |       |  |
|--|---|------|-------|--|
|  |   |      |       | computing platforms from theft, leakage, and deletion.   |
|  | INTRODUCTION TO FINANCE/<br>BASICS OF ECONOMICS/ESSENTIAL OF PEACE & SUSTAINABILITY | SDG9 | SDG11 | Innovation and research related to achieve sustainable development, how to bring harmony in society                                    |
|  | PROJECT   | SDG9 | SDG12 | An experience of working on skills and technology to increase team management skills, communication skills, and time management skills |
|  | MOBILE APP. ANALYTICS   | SDG9 | SDG11 | IMPLEMENTING MOBILE TOOLS, In-app analytics describes everything a user does within an application                                     |

## 2. Alignment of Problem statements with UN SDGs

Project Based Learning is a good pedagogy to provide learning skills, competencies , and attitude to the students to help them work towards achieving sustainable development goals.

By incorporating Project based learning into the classroom, young minds can actually be trained to think logically, investigate unsolved social problems and find the solutions by integrating science & Technology which can be a contributing factor towards achieving UN SDG Goals.

PBL also instills a global mindset as working towards UN SDGs is actually taking them ahead to solve global challenges.

Therefore, at the ideation stage only we have designed our rubrics so as to clear the expectation of teacher/mentor to the student which directs and motivates towards finding an unsolved societal problem as the problem statement to progress in their course.

Following grading criteria are used to guide and motivate the students to work towards SDG Challenges at the ideation stage.

### PBL rubrics mapping with (SDGs) (SAMPLE)

| Stage I:- Ideation |  |                          |  |   |  |
|--------------------|--|--------------------------|--|---|--|
| SN<br>o            | Rubrics                                | Max<br>Mar<br>ks<br>(15) | Needs<br>Improvement   | Meets<br>Expectation  | Exceeds<br>Expectations  |
| R1.<br>1           | Problem<br>Statement                   | 2                        | The problem<br>chosen is very<br>common and<br>being solved<br>using<br>fundamental<br>machine<br>learning<br>algorithms | The problem<br>chosen is<br>very<br>common<br>and<br>being solved<br>using latest<br>learning<br>algorithms | The problem<br>chosen is unique<br>and less<br>addressed and<br>being solved<br>using<br>fundamental /<br>advanced<br>learning<br>algorithms |
|                    |  | scale                    | 1  | 1.5   | 2  |
| R1.<br>2           | Holistic<br>Scope of<br>Sustainability | 1                        | Project is not<br>aligned with<br>UN SDGs  | Project is<br>aligned with<br>one or more<br>UN<br>SDGs   |  |
|                    |  | scale                    | 0  | 1   |  |

|      |                     |       |   |  |  |
|------|---------------------|-------|---|--|--|
| R1.3 | Region of relevance | 1.5   | Problem is being addressed at Local Level | Problem is being addressed at national Level | Problem is being addressed at global Level |
|      |                     | scale | 0.5                                       | 1.5  | 1.5  |

**SCHOOL OF EDUCATION & HUMANITIES**  
**DEPARTMENT OF EDUCATION**

In the context of academic teaching and learning, the SDGs can serve as a useful tool for promoting a more comprehensive and integrated approach to education. The following tables show the mapping of our course curriculum with the SDGs as a sample.

**Course mapping with (SDGs)**

|                   |
|-------------------|
| <b>Semester 1</b> |
|-------------------|

| <b>Program</b>             | <b>Course</b>                                   | <b>Integrated SDG</b> |           | <b>Topics</b>  |
|----------------------------|---|-----------------------|-----------|--|
| B. Sc. B. Ed.              | Diversity of Microbes and Thallophytes          | SDG1<br>5             | SDG1<br>4 | General account, distribution, types, structure, reproduction, ecological and economic importance: Lichens   |
| B.Ed<br>Special Education  | Human Growth & Development                      | SDG4                  | SDG3      | Learning Theories and their classroom implications, Psychological Well-Being   |
| B.Ed.<br>Special Education | Creating an Inclusive Classroom                 | SDG4                  | SDG1<br>6 | Important aspects of Inclusive Educations, Characteristics, aims and objectives of Inclusive Education, models of inclusive education, strategies for an inclusive classroom |
| B.Ed.                      | Child Development and Teaching Learning Process | SDG3                  | SDG5      | Child Abuse. Gender discrimination   |
| B.Ed.                      | Pedagogy of School Subjects                     | SDG4                  |           | Action research: Concept and Identification of problems faced by the teachers in the   |

|              |   |      |       |  |
|--------------|---|------|-------|--|
| B. A. B. Ed. | Microeconomics: Theory and Applications I | SDG8 | SDG12 | Economies and Diseconomies of Scale; Consumer and Producer Equilibrium |
| B. A. B. Ed. | English: Renaissance & Restoration        | SDG4 | SDG4  | Literature & Society   |

| Semester 2             |   |                |       |  |
|------------------------|---|----------------|-------|--|
| Program                | Course                                    | Integrated SDG |       | Topics   |
| B.A B. Ed.             | Microeconomics: Theory and Application II | SDG8           | SDG9  | Perfect and imperfect market structures  |
| B.Ed Special Education | Creating an Inclusive Classroom           | SDG4           | SDG16 | Important aspects of Inclusive Educations, Characteristics, aims and objectives of Inclusive Education, models of inclusive education, strategies for an inclusive classroom |

B.Ed  
Special  
Curriculum

Designing, SDG4  
Curriculum Design and  
Development: Subject-centered,

Learner-centered (CWLD),  
Learning-centered

|                 |                                |       |      |   |
|-----------------|--------------------------------|-------|------|---|
| Educ<br>io<br>n | Adaptation and Evaluation      |       |      |   |
| B. Ed.          | Learning and Teaching          | SDG4  | SDG4 | THEORIES OF LEARNING and their educational implications   |
| B. Ed.          | Pedagogy of School Subjects    | SDG4  |      | Action research: Concept and Identification of problems faced by the teachers in the Classrooms |
| B.Sc. B. Ed.    | Zoology: Animal Diversity – li | SDG15 | SDG6 | Insects as vectors a. mosquito b. housefly c. sand-fly d. tsetse fly                            |

| Semester 3 |        |                |        |
|------------|--------|----------------|--------|
| Program    | Course | Integrated SDG | Topics |

|                              |  |           |       |  |
|------------------------------|--|-----------|-------|--|
| B.Ed<br>Special<br>Education | Disability<br>Specialization                         | SDG4      |       | Lesson planning and execution on different levels for selected subjects.   |
| B.Ed<br>Special<br>Education | Main Disability<br>Special School                    | SDG4      |       | Develop and deliver the lessons in special education setup   |
| B. Ed.                       | Gender, school<br>and Society                        | SDG5      | SDG10 | Gender equality- Role of schools in reinforcing gender equality, Role of peers in reinforcing gender equality, Role of teachers in reinforcing gender equality, Role of curriculum and textbook in reinforcing gender equality |
| B.Sc B.<br>Ed.               | Gymnosperms<br>and<br>Reproduction in<br>Angiosperms | SDG1<br>5 | SDG13 | General characters, distribution, classification, affinities and economic importance   |

| <b>Semester 4</b> |               |                           |               |
|-------------------|---------------|---------------------------|---------------|
| <b>Program</b>    | <b>Course</b> | <b>Integrated<br/>SDG</b> | <b>Topics</b> |

|                              |  |      |      |   |
|------------------------------|--|------|------|---|
| B.Ed.                        | Education in<br>Contemporary<br>India    | SDG4 | SDG4 | Mudaliar Commission (1952), Education Commission (1964-66), NPE 1968; NPE 1986 and its modified version 1992 Right to Education Act 2009: Right of children to free and compulsory education, NEP 2020, Midday meal scheme, Three language Formula, Equity in education, Modernization and Privatization of Education, Role of educational agencies-NCERT, SCERT, CBSE, ICSE, Open and Distance Education, Role of teacher in universal and inclusive education, National System of Education |
| B.Ed<br>Special<br>Education | Cross-<br>Disability<br>and<br>Inclusion | SDG4 |      | Planning and implementation of IEP for Children with special needs.   |

| Semester 5 |                              |                |       |   |
|------------|------------------------------|----------------|-------|---|
| Program    | Course                       | Integrated SDG |       | Topics  |
| BA B.Ed.   | Literary Criticism           | SDG4           | SDG4  | The various stages in the evolution of literary criticism |
| BA B.Ed    | Indian Economy               | SDG9           | SDG12 | Industrial Sector in India                                |
| BSc B.Ed   | Ecology and Animal Behaviour | SDG3           | SDG15 | Hormonal control  |

| Semester 6 |   |                |       |   |
|------------|---|----------------|-------|---|
| Program    | Course                                    | Integrated SDG |       | Topics  |
| BSc B.Ed   | Plant Physiology and Metabolism           | SDG13          | SDG15 | Water relations in plants   |
| BA B.Ed    | Money and Banking                         |                | SDG10 | Commercial Banking and Monetary Policy  |
| BSc B.Ed   | Developmental Biology and Applied Zoology | SDG15          | SDG11 | Basic principles of practices in culturing of i) silkworms (Sericulture), ii) bees (Apiculture), iii) Aquaculture – fish, prawn and shellfish |

| Semester 7 |                    |                |      |   |
|------------|--------------------|----------------|------|---|
| Program    | Course             | Integrated SDG |      | Topics  |
| BSc B.Ed   | Numerical Analysis | SDG4           | SDG9 | Lifelong Learning: to interpolate, find solution of nonlinear equations, simultaneous equations |

|         |            |      |      |  |
|---------|------------|------|------|--|
| BA B.Ed | Internship | SDG4 | SDG4 | Teaching competency, action research, reflective journal, case study, lesson plans |
|---------|------------|------|------|--|

| Semester 8 |  |                |      |   |
|------------|--|----------------|------|---|
| Program    | Course   | Integrated SDG |      | Topics  |
| BA B.Ed    | School Leadership and Management                     | SDG4           | SDG4 | Concept of Group dynamics, types of groups, stages of group formation, Conflict management: Concept and Strategies, Stress management: Concept and Strategies |
| BSc B.Ed   | Biochemistry, Plant tissue culture and Biotechnology | SDG15          | SDG3 | Biochemistry  |
| BA B.Ed    | Statistics   | SDG8           |      | Correlation and Regression  |

**SCHOOL OF SCIENCES**  
**DEPARTMENT OF SCIENCES**

Courses mapped with SDGs

In the context of academic teaching and learning, the SDGs can serve as a useful tool for promoting a more comprehensive and integrated approach to education. The following tables show the mapping of our course curriculum with the SDGs as a sample.

**Course mapping with (SDGs) (Chemistry)**

| Semester1                     |                       |                |       |   |
|-------------------------------|-----------------------|----------------|-------|---|
| Program                       | Course                | Integrated SDG |       | Topics  |
| <b>B.Sc.(H)<br/>CHEMISTRY</b> | GREEN CHEMISTRY       | SDG6           | SDG11 | Twelve principles of chemistry, Water chemistry, Green solvents, Green Engineering. |
| Semester-2                    |                       |                |       |   |
| <b>B.Sc.(H)<br/>CHEMISTRY</b> | Environmental Science | SDG6           | SDG15 | Pollution, Ecosystem etc  |
| Semester 3                    |                       |                |       |   |

|                                |                           |                           |
|--------------------------------|---------------------------|---------------------------|
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | development               | Sustainable development E |
| Environmental Sustainable      | SDG12 SDG14 Environmental | Waste Management          |

|                                |  |           |        |  |
|--------------------------------|--|-----------|--------|--|
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Applied<br>Philosophy                                    | SDG10     | SDG16  | Secularism—its nature and<br>implications, Moral Philosophy<br>of religion                           |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Applied<br>Sociology                                     | SDG1      | SD2    | Issues in urban<br>development-Population, poverty   |
| <b>Semester 4</b>              |  |           |        |  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | E Waste<br>Management                                    | SD<br>G12 | SDG14  | E Waste Management   |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Industrial<br>Chemistry                                  | SD<br>G7  | SDG9   | Chemistry of cosmetics and<br>perfumes; Silicate Batteries ;<br>Batteries; catalyst and<br>catalysis |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Environmen<br>tal Ethics &<br>Sustainable<br>development | SD<br>G11 | SDG13  | Sustainable development;<br>Sustainable strategies and<br>reporting; d Contemporary Issues           |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Major Project  | SDG9      | SDG8   | Understand Research &<br>Innovation Skill  |
| <b>Semester 5</b>              |  |           |        |  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Chemistry in<br>Agriculture                              | SDG2      | SDG12  | Fertilizers, Pesticides, fungicides  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Nanotechnology   | SDG6      | SDG7   | Application of nanotechnology<br>in water filtration, Role of<br>nanotechnology in Energy            |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Fuel Chemistry   | SDG7      | SDG13  | Classification of energy<br>resources; disadvantages of<br>conventional energy resources             |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Analytical<br>Chemistry and<br>spectroscopy              | SDG8      | SDG9   | Analytical chemistry;<br>physicochemical method of analysis  |
| <b>Semester 6</b>              |  |           |        |  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Chemicals &<br>Environment                               | SDG6      | SDG11  | water Treatment; Chemistry<br>of Water; Water quality<br>parameters                                  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Food Chemistry   | SDG<br>12 |        | Food Chemistry   |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Clinical &<br>Pharmaceuti<br>cal                         | SDG 3     | SDG 11 | Amino acids; protein;<br>enzyme; carbohydrate  |

|                                |  |       |       |  |
|--------------------------------|--|-------|-------|--|
|                                | Chemistry                                |       |       |  |
| <b>B.Sc. (H)<br/>CHEMISTRY</b> | Instrumental Method of Chemical Analysis | SDG 8 | SDG 9 | Technical aspects of various instruments such as spectroscopy, chromatography, mass spectroscopy |

### Course mapping with (SDGs) (Physics)

| Semester-1                    |  |                |  |   |
|-------------------------------|--|----------------|--|---|
| Program                       | Course                                     | Integrated SDG |  | Topics  |
| <b>B. Sc. (PH) (1st Sem.)</b> | Programming For Problem Solving Using CLab | SDG4           |  | Information And Communications Technology Skills                |
| <b>B. Sc. (PH) (1st Sem.)</b> | Communicative English                      | SDG4           |  | Quality education: Use in personal as well as professional life |

| Semester-2                               |                       |                          |  |  |
|--|-----------------------|--------------------------|--|--|
| Program                                  | Course                | Integrated SDG           |  | Topics   |
| <b>B. Sc. (PH) (2<sup>nd</sup> Sem.)</b> | Environmental Science | SDG4,<br>SDG6,<br>SDG 12 |  | Environment Education, Environmental Pollution, Integrated Water Resource Management |

|                               |                         |  |  |  |
|-------------------------------|-------------------------|--|--|--|
| <b>B. Sc. (PH) (3rd Sem.)</b> | Applied Psychology      | SDG16  |  | Introduction to Psychology, Psychological Abuse  |
| <b>B. Sc. (PH) (3rd Sem.)</b> | Applied sociology       | SDG8,SDG10   |  | Social change & mobility   |
| <b>B. Sc. (PH) (3rd Sem.)</b> | basics of economics     | SDG 1, SDG 4, SDG 8, SDG 12  |  | Economic Resource & Access, LifeLong Learning, Economic Activity, Economic Development, Economic Growth, Economic Impact, GDP, Production and Resource Use |
| <b>B. Sc. (PH) (3rd Sem.)</b> | Introduction To Finance | SDG8,SDG9(Decent work and economic growth, industry innovation & infrastructure) |  | Time value of money, capital budgeting, capital structure, financial analysis & planning   |

| <b>Semester-2</b>             |                       |                       |      |   |
|-------------------------------|-----------------------|-----------------------|------|---|
| <b>Program</b>                | <b>Course</b>         | <b>Integrated SDG</b> |      | <b>Topics</b>   |
| <b>M. Sc. (PH) (2nd Sem.)</b> | Scientific Research I | SDG4                  | SDG9 | Analysis of different approach/methodology for experiments and Simulation, Research and development |

| <b>Semester-3</b>             |                         |   |  |  |
|-------------------------------|-------------------------|---|--|--|
| <b>Program</b>                | <b>Course</b>           | <b>Integrated SDG</b>   |  | <b>Topics</b>  |
| <b>B. Sc. (PH) (3rd Sem.)</b> | Mini Project 1 (PHN204) | SDG7  |  | Research and development   |
| <b>B. Sc. (PH) (3rd Sem.)</b> | French I                | SDG4 (Lifelong learning, Quality Education, learning opportunities) |  | Les articles (défini et indéfini) ER verbs Posez les questions l'heure<br>La culture & la civilization |

|                                      |                           |  |  |   |
|--------------------------------------|---------------------------|--|--|---|
| <p><b>B. Sc. (PH) (3rd Sem.)</b></p> | <p>Spanish I</p>          | <p>SDG4<br/>(Lifelong learning, Quality Education, learning opportunities)</p> |  | <p>Los articulos verbo Ser<br/>Verbos regulares<br/>Demonstrativos<br/>Interrogativos</p>   |
| <p><b>B. Sc. (PH) (3rd Sem.)</b></p> | <p>German I</p>           | <p>SDG4<br/>(Lifelong learning, Quality Education, learning opportunities)</p> |  | <p>Artikeln -regelmäßige<br/>Verben W-Fragen<br/>Vorstellung Kultur<br/>von Deutschland</p> |
| <p><b>B. Sc. (PH) (3rd Sem.)</b></p> | <p>Applied philosophy</p> | <p>SDG10,SDG16</p>   |  | <p>Human Rights And Laws</p>  |

**Semester-4**

| Program                      | Course                                | Integrated SDG   |       | Topics  |
|------------------------------|---------------------------------------|--|-------|---|
| <b>B. Sc. (PH)(4th Sem.)</b> | Mini Project 2 (PHN207)               | SDG7   | SDG12 | Research and Development, Quality Education   |
| <b>B. Sc. (PH)(4th Sem.)</b> | Environment & sustainable development | SDG2 (Nutrition),<br>SDG3 (Indigenous knowledge),<br>SDG8 (Climate Change),<br>Sustainable Tourism),<br>SDG5 (gender Issues) |       | Nutrition, Indigenous knowledge, Climate Change, Sustainable Tourism, Gender issues |

**Semester-5**

| Program                      | Course                                    | Integrated SDG |       | Topics   |
|------------------------------|---|----------------|-------|--|
| <b>B. Sc. (PH)(5th Sem.)</b> | Digital Mini Project 2 (PHH302B) (PHN207) | SDG4           | SDG15 | AND, OR and NOT Gates (realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gates, Memory interfacing Memory Map, Main features and Components of 8085 Microprocessor, Block diagram. |

**Semester-6**

| Program                      | Course                       | Integrated SDG |       | Topics   |
|------------------------------|------------------------------|----------------|-------|--|
| <b>B. Sc. (PH)(6th Sem.)</b> | Electronic Devices (PHH306B) | SDG3           | SDG12 | Memory interfacing Memory Map, Main features and Components of 8085 Microprocessor, Block diagram. |
| <b>B. Sc. (PH)(6th Sem.)</b> | MAJOR PROJECT (PHN307)       | SDG7           |       | Research and Development, Quality Education  |

|                              |  |  |  |  |
|------------------------------|--|--|--|--|
| <b>B. Sc. (PH)(5th Sem.)</b> |  |  |  |  |
|------------------------------|--|--|--|--|

| Semester-1             |                               |                |      |  |
|------------------------|-------------------------------|----------------|------|--|
| Program                | Course                        | Integrated SDG |      | Topics   |
| M. Sc. (PH) (1st Sem.) | Physics of Electronic Devices | SDG4           | SDG9 | Physics of Electronic Devices, Highfrequency devices (includinggenerators and detectors) |

| Semester-3                         |   |                |      |   |
|------------------------------------|---|----------------|------|---|
| Program                            | Course  | Integrated SDG |      | Topics  |
| M. Sc. (PH) (3 <sup>rd</sup> Sem.) | Synthesis and Characterization Techniques (PHH605B) | SDG 7          | SDG3 | Electron beam evaporation technique, Quantumdot materials, Quantum dot materials, Ramanand FTIR spectroscopy, Scanning electronmicroscopy, Field-emission Scanning electronmicroscopy |
| M. Sc. (PH) (3 <sup>rd</sup> Sem.) | Scientific Research II                              | SDG 4          | SDG9 | Planning of experiments and simulation,Analysis of different approach/methodology forexperiments and Simulation , Research anddevelopment   |

| Semester-4             |                         |                |       |  |
|------------------------|-------------------------|----------------|-------|--|
| Program                | Course                  | Integrated SDG |       | Topics   |
| M. Sc. (PH) (4th Sem.) | Nanotechnology(PHH608B) | SDG7           | SDG12 | Morphology of Nanoparticles,Nanoparticle Morphology,Nano-structures in wastewatertreatment, "Nano-structures in bacteria entrapment, Application ofnano-structures in Electronics. |
| M. Sc. (PH) (4th Sem.) | Major Project           | SDG4           | SDG9  | Research and development, innovationbased research methodology, preparingprototype   |

### Course mapping with (SDGs) (Mathematics)

| Semester1          |   |                |              |  |
|--------------------|---|----------------|--------------|--|
| Program            | Course  | Integrated SDG |              | Topics   |
| B.Sc(Maths) Semi   | Programming For Problem Solving Using C Lab               | SDG4           |              | Problems Solving, Using C Programming  |
|                    | Maths Lab - I   | SDG4           |              | Mathematical Problem Using Softwares Like Octave, R Etc                                |
|                    | Communicative English                                     | SDG4           |              | Group Discussions  |
| M.Sc(Maths) Sem I  | Excel Workshop<br>Mathematics Lab-I<br>Python Programming | SDG4           |              | Solve Mathematical Problem Using Softwares Like Octave, R ,Python Etc                  |
| Semester2          |   |                |              |  |
| Program            | Course  | Integrated SDG |              | Topics   |
| B.Sc(Maths) Semii  | Math Lab – Ii   | SDG4           |              | Simplify Arithmetic Calculations Using Octave & Microsoft Excel                        |
|                    | Environmental Science                                     | SDG4           | SDG6, SDG 12 | Environment Education, Environmental Pollution, Integrated Water Resource Management   |
| M.Sc(Maths) Sem Ii | Mathematics Lab – Ii Scientific Research - I              | SDG4           |              | Solve Mathematical Problem Using Softwares Like Octave, R Etc And Educational Research |
| Semester3          |   |                |              |  |
| Program            | Course  | Integrated SDG |              | Topics   |

|                     |  |             |             |   |
|---------------------|--|-------------|-------------|---|
| B.Sc(Maths) Semiii  | Math Lab – Iii                             | SDG4        |             | Elaborate Scientific Writing Using Latex  |
|                     | Applied Philosophy                         | SDG10       | SDG16       | Human Rights And Laws   |
|                     | Applied Psychology                         | SDG6        |             | Introduction To Psychology, Psychological Abuse   |
|                     | Applied Sociology                          | SDG8        | SDG10       | Social Change & Mobility  |
|                     | Introduction To Finance                    | SDG1, SDG4, | SDG8, SDG12 | Economic Resource & Access, Life Long Learning, Economic Activity, Economic Development, Economic Growth, Ecomic Impact, Gdp, Production And Resource Use |
| M.Sc(Maths) Sem Iii | Pedagogical Skills Scientific Research -II | SDG4        |             | Pedagogical Content Knowledge, Lifelong Learning, Education Research  |

#### Semester4

| Program           | Course                                | Integrated SDG |              | Topics  |
|-------------------|---------------------------------------|----------------|--------------|---|
| B.Sc(Maths) Semiv | Spanish Ii                            | SDG4           |              | -Ser Vs. Estar<br>- Verbos Irregulares<br>- Tiempo<br>- Verbos Reflexivos                   |
|                   | German Ii                             | SDG4           |              | Possessivepronomen<br>- Unregelmäßige Verben - Adjektiven<br>- Das Wetter<br>- Modal Verben |
|                   | Data Stuctures                        | SDG4           |              | Algorithm Analysis, Complexity Of Algorithm   |
|                   | Environment & Sustainable Development | SDG2           | SDG3, SDG8   | Nutrition, Indigenous Knowledge, Climate Change, Sustainable Tourism, Gender Issues         |
|                   | E-Waste                               | SDG12          | SDG14, SDG15 | Separation And Recycling Of E-Waste, Understanding Rohs And Reach                           |

|  |                 |      |  |                                      |
|--|-----------------|------|--|--------------------------------------|
|  | Mini Project-Ii | SDG4 |  | Literature Review And Report Writing |
|--|-----------------|------|--|--------------------------------------|

|                    |           |      |      |  |
|--------------------|-----------|------|------|--|
|                    | French Ii | SDG4 |      | - Les Aticles Patitifs<br>- Ir Verbs<br>- Les Exceptions <Er Verbs> - Les Adjectifs<br>- Les Verbs Pronominaux |
| M.Sc(Maths) Sem Iv | Project   | SDG4 | SDG8 | Learning Opportunities, Offset Project   |

### Semester5

| Program           | Course                                      | Integrated Sdg |                  | Topics  |
|-------------------|---|----------------|------------------|---|
| B.Sc(Maths) Sem V | Math Lab - Iv                               | SDG4           |                  | Interpolation   |
|                   | Introduction To Database Management Systems | SDG4           |                  | Sql Implementation<br>Query Writing<br>Normalization<br>Functional Dependency       |
|                   | Minor Project                               | SDG4           |                  | Literature Review And Report Writing  |
|                   | Environment & Sustainable Development       | SDG2           | SDG3, SDG8, SDG5 | Nutrition, Indigenous Knowledge, Climate Change, Sustainable Tourism, Gender Issues |

### Semester 6

| Program            | Course                               | Integrated SDG |      | Topics   |
|--------------------|--------------------------------------|----------------|------|--|
| B.Sc(Maths) Sem Vi | Fundamentals Of Machine Learning Lab | SDG4           |      | Machine Learning, Supervise Learning, Unsupervised Learning  |
|                    | Entrepreneurship Theory & Practice   | SDG4           | SDG8 | Entrepreneurship Skills, Climate Change, Sustainable Tourism |

**SCHOOL OF MANAGEMENT & COMMERCE**

**DEPARTMENT OF MANAGEMENT & COMMERCE**

**Course mapping with (SDGs)**

| <b>Program</b> | <b>Course</b> | <b>Integrated SDG</b> | <b>Topics</b> |
|----------------|---------------|-----------------------|---------------|
|----------------|---------------|-----------------------|---------------|

|                                    |   |  |  |  |
|------------------------------------|---|--|--|--|
| BBA (COMMON CORE)                  | Computer Information System                     | SDG9   |  | Function of different units of computer, Types of software (System and Application)                      |
| SUBJECTS – FAA, EFB, HC M, OM, BA) | Business Communication-I                        | SDG 4 (Quality education)                      | SDG9 (Industry, Innovation and Infrastructure) | Basic forms of communication, Process of communication, Impact of Encoding and Decoding in Communication |
|                                    |   |  |  |  |
|                                    | Marketing                                       | SDG9 (Industry, Innovation and Infrastructure) |  | Marketing environment,   |
|                                    | Management                                      |  |  | New Product Development, Integrated marketing communication  |
|                                    | Management Principles & Organizational Behavior | SDG9 (Industry, Innovation and Infrastructure) |  | Leadership for learning organizations. Trait, behavioral, contingency theories, and managerial grid.     |
| BBA FAA (ELECTIVE)                 | Micro Economics                                 | SDG8 (Decent work & Economic growth)           | SDG9 (Industry, Innovation and Infrastructure) | Demand and Supply, Central Problems, Production Curve  |
|                                    |   |  |  |  |
|                                    |   |  |  |  |

|                    |  |   |  |  |
|--------------------|--|---|--|--|
|                    | Financial Accounting                   | SDG4 (Quality Education)                            | SDG8 (Decent work & Economic growth)           | Computerized Accounting: Computers and Financial application, Accounting Software packages                       |
| BBA EFB (ELECTIVE) | Entrepreneurship Theory & Practices    | SDG8, SDG 12 (Responsible production & Consumption) | SDG9 (Industry, Innovation and Infrastructure) | Fundamentals of Disciplinary Knowledge, entrepreneurial skills & mindset, risk & return, opportunity recognition |
| BBA HCM (ELECTIVE) | Introduction to Health Care Management | SDG3(GOODHealth)                                    | SDG4 (Quality Education)                       | Systematic Planning and Control of inventory   |
|                    |  |   |  |  |
|                    |  |   |  |  |
| BBA OM (ELECTIVE)  | Principles of Manufacturing            | SDG9 (Industry, Innovation and Infrastructure)      | SDG13, SDG 12                                  | Sustainable manufacturing  |

|                    |                                    |  |  |   |
|--------------------|------------------------------------|--|--|---|
|                    |                                    | Innovation and Infrastructure)                 |  |   |
| BBA- BA (ELECTIVE) | Introduction to Business Analytics | SDG9 (Industry, Innovation and Infrastructure) |  | Data Management, data mining, data warehousing. Data science & ML, big data, application of analytics |

| Semester-2                                       |  |                            |  |                           |  |  |  |   |        |  |
|--|--|----------------------------|--|---------------------------|--|--|--|---|--------|--|
| Program  |  | Course                     |  | Integrated SDG            |  |  |  |   | Topics |  |
| BBA (COMMON CORE SUBJECTS – FAA,EFB,HC M,OM, BA) |  | Human Resource Management  |  |                           |  | SDG9 (Industry, Innovation and Infrastructure) |  | HR Planning, recruitment, compensation, performance appraisal, industrial relations, training & development, feedback |        |  |
|  |  |                            |  |                           |  |  |  |   |        |  |
|  |  |                            |  |                           |  |  |  |   |        |  |
|  |  | Financial Management       |  |                           |  | SDG9 (Industry, Innovation and Infrastructure) |  | Capital Budgeting, wealth maximization, capital structure decisions   |        |  |
|  |  |                            |  |                           |  |  |  |   |        |  |
|  |  | Advanced Excel             |  |                           |  | SDG9 (Industry, Innovation and Infrastructure) |  | Visualizing Data Using Conditional Formatting, Using Data Validation, Creating Charts and Graphic                     |        |  |
|  |  |                            |  |                           |  |  |  |   |        |  |
|  |  | Business Communication- II |  | SDG4( Quality education ) |  | SDG9 (Industry, Innovation and Infrastructure) |  | Global Communication, Understanding Self and others, Creativity and Communication                                     |        |  |
|  |  |                            |  |                           |  |  |  |   |        |  |



|                       |  | In Bankin<br>g<br>Sector   | Infrastru<br>cture)  | Inequ<br>alitis)                  |  |  |  |
|-----------------------|--|--|--|-----------------------------------|--|--|--|
|                       |  | Financial<br>Modelin<br>g  | SDG1<br>0  | SDG<br>12                         | Understanding of<br>financial analytics  |  |  |
| BBA EFB               |  | Copywr<br>ight,<br>Patents<br>&<br>Laws of<br>IPR                          | SDG9<br>(Industry,<br>Innova<br>tion<br>and<br>Infrastru<br>cture) | SDG<br>12                         | Legality & fairness  |  |  |
| (ELECTIVE)            |  |  |  |                                   |  |  |  |
|                       |  |  |  |                                   |  |  |  |
|                       |  | Strategi<br>es &<br>Practice<br>s of<br>Family<br>Owned<br>Enterpris<br>es | SDG9<br>(Industry,<br>Innova<br>tion<br>and<br>Infrastru<br>cture) | SDG<br>12                         | Parallel planning in<br>family businesses,<br>strategic<br>alternatives to growth<br>of familybusinesses,<br>strategic potential<br>matrix |  |  |
| BBA HCM<br>(ELECTIVE) |  | Public<br>Health   | SDG3   |                                   |  |  |  |
|                       |  | Global<br>Health   | SDG3,1<br>6  |                                   | Educate the Cause Of<br>Global Illness   |  |  |
| BBA OM<br>(ELECTIVE)  |  | Multimo<br>dal<br>Transpor<br>tation<br>Systems                            | SDG3<br>(Good<br>Health&<br>well                                   | SDG<br>7<br>(affo<br>rdabl<br>e & | Planning<br>considerations for<br>Pedestrians,<br>Planning<br>Considerations for<br>Bicyclists.  |  |  |

**SCHOOL OF LAW**

**Department of Law**

**Courses Mapped With SDGs**

**UG Courses**

| <b>Programme</b>   | <b>Course</b> | <b>Integrated SDGs</b>  |  | <b>Topics</b>  |
|--|---------------|---|--|--|
| <b>Semester 1</b>  |               |   |  |  |
| B.A.<br>LL.B.<br>(H)   | Sociology - I | SDG 10<br>(Reduce inequality within and among countries)  | SDG 16 (Promote peaceful and inclusive societies, provide access to justice, accountable and inclusive institutions) | Backward classes in India, Constitutional Provisions, Affirmative Actions - Reservation for SCs STs, OBCs and Women in Politics, Services and Educational Institutions |
| <b>Semester 2</b>  |               |   |  |  |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Legal Methods | SDG 16<br>(Promote peaceful and inclusive societies, provide access to justice, accountable and inclusive institutions) |  | Indian Legal System, Rule of Law, Basic concepts of legal system   |
| <b>Semester 3</b>  |               |   |  |  |

|  |                                 |  |   |   |
|--|---------------------------------|--|---|---|
| <p>B.A.<br/>LL.B. (H)<br/>/ B.B.A.<br/>LL.B.<br/>(H)/<br/>B.Com<br/>LL.B. (H)/<br/>LL.B.</p> | <p>Constitutional<br/>Law-I</p> | <p>SDG4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all)<br/>SDG 10 (Reduce inequality within and among countries)</p> | <p>SDG 16 (Promote peaceful and inclusive societies, provide access to justice, accountable and inclusive institutions)</p> | <p>Equality before laws and Equal protection of laws, Prohibition of discrimination &amp; Justice to weaker sections of society- SC/ST/WOMEN, Equality of opportunity in matters of public employment, Abolition of Untouchability &amp; Titles<br/><br/>Human trafficking, prohibition of child labour, right to education Protection of interests of minorities</p> |
| <p><b>Semester 4</b></p>   |                                 |  |   |   |

|  |                            |  |  |  |
|--|----------------------------|--|--|--|
| <p>B.A.<br/>LL.B. (H)<br/>/ B.B.A.<br/>LL.B.<br/>(H)/<br/>B.Com<br/>LL.B. (H)/<br/>LL.B.</p> | <p>Family<br/>Law – II</p> | <p>SDG 5 (Achieve gender equality and empower all women and girls)</p> |  | <p>Dower,<br/>Maintenance,<br/>Divorce</p> |
|--|----------------------------|--|--|--|

|   |                                  |   |   |   |
|---|----------------------------------|---|---|---|
| <p>B.A.<br/>LL.B. (H)<br/>/ B.B.A.<br/>LL.B.<br/>(H)/<br/>B.Com<br/>LL.B. (H)</p> | <p>Environmental<br/>Science</p> | <p>SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable</p> <p>SDG 12 - Ensure sustainable consumption and production patterns</p> | <p>SDG 13 - Take urgent action to combat climate change and its impacts</p> <p>SDG 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p> <p>SDG 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p> | <p>Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people, Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems, Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, equitable use of resources for sustainable lifestyles, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity</p> |
| <p><b>Semester 5</b></p>  |                                  |   |   |   |
| <p>B.A.<br/>LL.B. (H)<br/>/ B.B.A.</p>  | <p>Criminal Procedure</p>        | <p>SDG 16 (Promote and</p>  |   | <p>Right of Accused and arrested persons, Right to</p>  |

|   |      |   |  |  |
|---|------|---|--|--|
| LL.B. (H)/<br>B.Com<br>LL.B. (H)/<br>LL.B | Code | enforce<br>non-<br>discriminator y<br>laws and<br>policies for<br>sustainable<br>development) |  | register FIR and<br>Bail, criminal<br>justice<br>administration,<br>custodial violence,<br>under trial<br>prisoners, rarest of<br>rare test for capital<br>punishments, role of<br>police. |
|---|------|---|--|--|

**Semester 6**

|   |                |  |   |   |
|---|----------------|--|---|---|
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B.<br>(H)/LL.B. | Labour<br>Laws | SDG 1 - End<br>poverty in all its<br>forms<br>everywhere<br><br>SDG 8 -<br>Promote<br>sustained,<br>inclusive and<br>sustainable<br>economic<br>growth, full and<br>productive<br>employment<br>and decent<br>work for all | SDG 10 -<br>Reduce<br>inequality<br>within and<br>among<br>countries<br>SDG 11 - Make<br>cities and<br>human<br>settlements<br>inclusive, safe,<br>resilient and<br>sustainable<br>SDG 16 -<br>Promote<br>peaceful and<br>inclusive<br>societies for<br>sustainable<br>development,<br>provide access<br>to justice for all<br>and build<br>effective,<br>accountable and<br>inclusive<br>institutions at all<br>levels | Labour Courts,<br>Tribunals, Strike,<br>Lock Out, Lay Off,<br>Retrenchment and<br>Closure, Unfair<br>Labour Practices,<br>Penalties,<br>Offences by<br>Companies etc.,<br>social security<br>concept and<br>evolution,<br>Workmen's<br>Compensation Act,<br>1923, health and safety<br>of<br>workers, working<br>hours of adult,<br>employment of<br>children, provisions<br>regulating<br>employment of<br>women |
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**Semester 7**

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| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Competitio n Law                       | SDG17<br>(Strengthen the means of implementatio n and revitalize the global partnership)<br>SDG8 (Decent work and economic growth) | SDG17<br>(Strengthen the means of implementation and revitalize the global partnership)<br><br>SDG8 (Decent work and economic growth) | Prohibition of abuse of dominance;<br>Prohibition of anti-competitive agreements  |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Juvenile Justice                       | SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all                       | SDG 5 - Achieve gender equality and empower all women and girls   | Rights of child, status of child in matters of maintenance, adoption, surrogacy etc., child and criminal justice administration, offences against children                  |
| <b>Semester 8</b>  |  |  |   |   |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Intellect ual property Rights Law - II | SDG 8<br>(Increase aid for trade support for developing countries)   | SDG 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation)                     | TRIPS, BERNE CONVENTION, Traditional Knowledge and folklore.  |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Law on Infrastruc tu re Develop me nt  | SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrializatio n and foster innovation                 | SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable   | Infrastructure development and economic development, Challenges for local players and foreign companies looking to enter the market, Emerging Options for Project Financing |
| <b>Semester 9</b>  |  |  |   |   |
| B.A.<br>LL.B. (H)<br>/ B.B.A.  | Public Internation                     | SDG16 (Peace, Justice and Strong   | SDG16 (Peace, Justice and Strong  | International Court of Justice, Human Rights  |

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| LL.B. (H)/<br>B.Com<br>LL.B. (H)   | al Law<br>and<br>Human<br>Rights  | institutions)  | institutions)   |   |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H)/<br>LL.B. | Environ<br>me ntal<br>Law   | SDG 3 -<br>Ensure healthy<br>lives and<br>promote<br>well-being for<br>all at all ages<br><br>SDG 13 - Take<br>urgent action<br>to combat<br>climate<br>change and<br>its<br>impacts | SDG 14 -<br>Conserve and<br>sustainably use<br>the oceans, seas<br>and<br>marine<br>resources for<br>sustainable<br>development<br><br>SDG 15 - Protect,<br>restore and<br>promote<br>sustainable use of<br>terrestrial<br>ecosystems,<br>sustainably<br>manage forests,<br>combat<br>desertification,<br>and halt and<br>reverse<br>land<br>degradation<br>and halt<br>biodiversity loss | Environment and<br>Environment Pollution:<br>Problem and prospects,<br>International Norms:<br>Sustainable<br>Development<br>Sustainable<br>Development and<br>International Legal<br>Order in 21st Century:<br>Precautionary<br>Principle, Polluter Pays<br>Principle,<br>Environmental<br>Protection through<br>Public Interest<br>Litigation,<br>Environemntal<br>Protection Act<br><br>The Water (Prevention<br>and Control of<br>Pollution) Act, 1974,<br>Air<br>(Prevention and<br>Control of Pollution)<br>Act, 1981, Noise<br>Pollution Control<br>Order, 2000, Land<br>Pollution |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H)           | Informat<br>io n<br>Technolo<br>gy and<br>Telecom<br>mu<br>nication<br>Laws | SDG 9<br>(INDUSTRY,<br>INNOVATI<br>ON AND<br>INFRASTRU<br>CT URE)  | SDG 8<br>(DECENT<br>WORK AND<br>ECONOMIC<br>GROWTH)   | Concept of<br>technology and Law,<br>E-governance.  |

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| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H) | Gender<br>Justice | SDG 5<br>(Achieve<br>gender<br>equality and<br>empower all<br>women and girls) | SDG 10<br>(Reduce<br>inequality<br>within and<br>among<br>countries) | Gender equality,<br>gender justice and<br>feminist<br>jurisprudence;<br>Deconstructing<br>Man, Woman &<br>Other;<br>Freedom of<br>expression and right<br>to sexual |
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|  |  |  |  | identity; Legal<br>protection for the<br>LGBTQIA+<br>people  |
| <b>Semester 10</b>   |  |  |  |  |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B.<br>(H)/LL.B | Clinic IV<br>(Professi<br>onal<br>Ethics<br>and<br>Professio<br>nal<br>Accounti<br>ng<br>System) | SDG 4 -<br>Ensure<br>inclusive and<br>equitable<br>quality<br>education and<br>promote<br>lifelong<br>learning<br>opportunities<br>for all |  | Code of ethics,<br>Professional<br>Misconduct, Duty<br>towards society   |
| B.A.<br>LL.B. (H)<br>/ B.B.A.<br>LL.B.<br>(H)/<br>B.Com<br>LL.B. (H)         | Cyber<br>Crimes<br>and Law   | SDG 16 (Peace<br>and Justice<br>strong<br>institutions)  | SDG 9<br>(Industry,<br>Innovation and<br>Infrastructure) | Legal Framework<br>related to Cyber<br>Crimes<br>(Relevant authorities<br>and their powers to<br>conduct trials and<br>impose<br>punishments),<br>Intellectual Property<br>in Cyber World. |

## ANNEXURE 2

### Rubrics for the Evaluation of Project Based Learning

- 1. Rubric (R1.2) Holistic Scope of Sustainability as one of the parameter for students to work on problems around Sustainable Development Goals in CST**
- 2. Teaching of GSS Using Problem Based Learning; Awareness on Gender Equality and Sensetization (SDG 5)**

#### SCHOOL OF ENGINEERING

#### Computer Science & Technology

Following rubrics have been designed for evaluation of five stages of project development in courses being conducted using project Based Learning. The rubrics have been submitted for copyright (Application no: 7348/2022-CO/L 48949).

The stage 1 evaluation incorporates Rubric (R1.2) Holistic Scope of Sustainability as one of the parameter for students to work on problems around Sustainable Development Goals.

*Teaching GSS using problem-based learning: A research-oriented approach to develop awareness on Gender equality and sensitization (SDG 5)*

*- Shivani Bakshi<sup>1</sup>*

Problem-based Learning (PBL) involves student-centred pedagogy wherein students learn about a subject through the experience of solving a prevalent issue, or a problem with a definite solution. Even if the student is unable to arrive at a tangible solution, PBL ushers hope to develop scientific temperament towards education. Thus, encouraging knowledge inquisition, enhanced group collaboration and communication.

The course on Gender, School and Society offers a Gestalt view of the embedded process of gender discrimination, stereotyping and conditioning in our education system overall. The subject besides juxtaposing the idea with practice offers a pedestal to raise concerns regarding paradigmatic shifts in our perception on gender construction in the society. Teaching the subject offers an insightful understanding of current challenges across the socio-cultural norms and binaries. Pedagogy required for this subject is hence, subjected to teaching-learning through brainstorming, supporting, guiding, and close monitoring on the areas identified by the students as areas of their interest. Stretched on the continuum of Constructivism, students in GSS are constantly exposed to the paradigmatic shift in defining gender roles traditionally in our society. Through classroom teaching, students are scaffolded towards group research on the topics prescribed in the syllabus, thus ensuring group learning and collaboration.

The objectives of the assessment are as follows:

Objectives:

The students towards the end of the assessment will be able to:

1. Define important concepts in Gender studies.
2. Explain the paradigmatic shift in education under the lens of gender.
3. Illustrate with examples gender-based discrimination in the society.
4. Compare different intersectionality points between gender, school/ higher education and SDGs envisioned under Agenda 2030.

The assignment is a reflective indicator of how gender is perceived, constructed and floated across the social structures through education in Indian society. The assignment initiates research enquiry into the domains of gender in Indian context through following stages:

1. Selection of any subtopic from the units prescribed in the syllabus.
2. Framing a research argument by situating the area in the student group's immediate private/public domain to ensure a strong contextual understanding.
3. Identify and explore the field to juxtapose lived experiences vs their preconceived notions.
4. Write the paper using the data collected and administer basic statistical methods to gain an insight on the immediate issues, explore possibilities to link the paper to other SDGs and carve out potential solutions/ models to existing problems.
5. The format of the assignment is as follows:
  - a. Introduction
  - b. Literature review (to be categorically identified as sub-themes)
  - c. Rationale
  - d. Research questions and objectives
  - e. Method
  - f. Tools and techniques
  - g. Findings and Analysis
  - h. Discussion/ Conclusion

The rubric for the assessment is as follows:

|                          |   |                                    |   |   |  |          |
|--------------------------|---|------------------------------------|---|---|--|----------|
| <b>Critical Thinking</b> | Minimal input in critical engagement with the field | Questioning and analysing evidence | Applying reasoned approach to conceptualize | Reflecting upon/ reasoning the findings | Synthesizing findings and literature to contribute to further research | <b>3</b> |
|--------------------------|---|------------------------------------|---|---|--|----------|

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| <b>Task Distribution</b>                 | Minimum or maximum delegation of tasks       | Is planned and assigned to members single-handedly | Is effectively planned as per the everyone's potential                  | Is distributed as per everyone's potential and shortcomings        | Briefing done before distribution of the tasks as per everyone's potential and shortcomings | <b>3</b> |
| <b>Leadership</b>                        | Autocratic/ Laissez-Fair                     | Autocratic Laissez fair                            | Democratic  | Situational leadership   | Transformational Leadership   | <b>3</b> |
| <b>Communication</b>                     | Minimum communication                        | Unilateral communication                           | Dialogue is present   | Effective Communication, considering all the necessary feedback    | Communication with feedback along with reflective practices to innovate                     | <b>3</b> |
| <b>Presentation</b>                      | Presented throughout by a single member only | Presented by two members                           | Presented by people respect to everyone's contribution                  | Presentation is fluid with everyone's participation                | Presentation is dialogic with members exemplifying each other's points                      | <b>3</b> |
| <b>Cultural &amp; Global Citizenship</b> | Reference to national-level studies          | Reference to international and national studies    | Reference to national, international and local context-specific studies | Synthesising the three locales of study to draw empirical findings | Relate international citizenship to the Indian motto of 'Vasudev Kutumba ka m'              | <b>3</b> |

|                        |  |   |   |  |  |          |
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| <b>Problem Solving</b> | Identifying what is already known from existent literature | Strategizes the problem with relevant methods | Assessing action in generating course of action | Evaluating the impact of possible interventions to carry out in most viable manner | Approaching the solution with a flexible and determined plan of action | <b>3</b> |
| <b>SDG Mapping</b>     | Paper caters to SDG 5 only                                 | Paper caters to SDG 4 & 5 only                | Paper caters to 4 or more SDGs                  | Paper caters to 5 or more SDGs   | Paper caters to at least 6 or more                                     | <b>3</b> |

## **Courses offered to bring awareness of SDGs**

### **Course offered as an elective subject to undergraduates of Manav Rachna University**

Manav Rachna Centre for Peace and Sustainability, at Manav Rachna University, has developed an insightful course entitled 'Essentials of Peace and Sustainability.' This course is made available to undergraduate students as an elective subject, with the primary objective of fostering greater awareness of the ambitious Sustainable Development Goals (SDG) agenda of 2030, its various components, and imparting the knowledge and skills required for peace-building.

The course draws upon experiential and project-based learning approaches, as well as collaborative and cooperative learning strategies, to provide learners with a comprehensive and immersive educational experience. As part of the course, students select a specific SDG and propose a solution based on their acquired knowledge in their respective domains, making the learning experience both practical and impactful.

To ensure the quality and rigor of the course content, it is developed by a team of experts in the field of Peace and Sustainability. The course is delivered in a blended mode, leveraging technology and traditional methods to provide students with the flexibility and convenience of learning in a manner that best suits their needs. The course has so far successfully been completed by 450 students, making it a valuable and sought-after addition to the academic offerings of the university.

#### **• Course offered by Fakir Mohan University**

The course entitled "Essentials of Peace and Sustainability" is presently being offered to Fakir Mohan State University, Balasore, Orissa. This course is offered in a blended mode of delivery, wherein the theoretical components are imparted through our esteemed university through virtual platform Canvas, while the practical aspects are being attended to by the Department of Education in a physical mode.

#### **• Course offered by OER4BW**

The course also has been made available as an Open Educational Resource (OER) for the benefit of undergraduate students. This laudable initiative is in alignment with the OER4BW (Open Educational Resources for Better World) program, an illustrious initiative supported by the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

The carefully crafted course on "Essentials of Peace and Sustainability" is designed to equip young learners with a thorough and nuanced understanding of the crucial concepts and principles that underpin the fields of peace and sustainability. By leveraging the power of cutting-edge technology and innovative pedagogical approaches, the course material is delivered in an engaging and interactive manner that inspires learners to think critically and reflect deeply on the subject matter.