Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Essential of Information Technology		
Course Code	CSL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember various concept of Information Technology, Computer System, various peripherals, I/o devices, and storage devices.**(BL1-Remember)** **CO2-** To understand Basic concept of operating system, Performance evaluation of multiple interfaces, and installation process.**(BL2-Understand)** **CO3-** .To implement various networking concepts, topologies and remove deadlocks. **(BL3-Apply)** **CO4-** To train & test various open source software, database management software with different domains of dataset.**(BL4-Analyze)** **CO5-** To evaluate and summarize the performance of various algorithm, flowchart and SDLC models using statistical & visualization tools.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG17(Partnerships for the goals)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	1	1	2
CO2	1	-	-	-	2	-	-	-	-	-	-	-	3	2	2
CO3	2	-	-	-	1	-	2	-	-	-	-	-	3	2	2
CO4	-	-	-	2	2	2	-	2	-	-	1	1	2	2	2
CO5	-	-	1	-	-	2	-	1	-	-	-	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Programming in C		
Course Code	CSL0102[T]		
Course Outcomes & Bloom's Level	**CO1-** Remember the Basic Organization of a Computer and basic concept of programming language (Knowledge, Understand)**(BL1-Remember)** **CO2-** Apply and analyze the basic concept of Conditional Statements, Loops & Array. (Apply, Analyze).**(BL2-Understand)** **CO3-** Apply and analyze the basic concept of Pointer & Functions. (Apply, Analyze).**(BL3-Apply)** **CO4-** Apply and analyze the basic concept of Structure and Union &Dynamic Memory Management. (Apply, Analyze).**(BL3-Apply)** **CO5-** Understand the File Management system, Command Line Arguments and Preprocessor Introduction (Knowledge, Understand)**(BL4-Analyze)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	1	1	2
CO2	1	2	-	-	-	-	-	-	-	-	-	-	3	2	1
CO3	-	-	1	-	-	-	-	-	-	-	-	-	3	2	-
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Communication Skills & Colloquim		
Course Code	HUL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** Determine interpersonal skills and be an effective goal-oriented team player. **(BL1-Remember)** **CO2-** Classify and formulate the elementary intricacies of Scientific and Technical Writing using applicative grammar construct. **(BL2-Understand)** **CO3-** Examine attitudes, emotional intelligence and understand its influence on behavior. **(BL3-Apply)** **CO4-** Justify approaches to conflict resolution.**(BL4-Analyze)** **CO5-** Evaluate the significance of formal communication**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	2	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	1	1	-	1	-	-	-	-	2	-	-	3	2	3
CO4	3	2	-	2	1	-	-	-	-	2	-	-	2	3	3
CO5	3	2	-	2	1	-	-	-	-	2	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Calculus for Engineers		
Course Code	MAL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember the basics about the Successive Differentiation, Definite Integration and Vector Calculus.**(BL1-Remember)** **CO2-** To understand the concepts of derivatives (Partial and Successive), Integration and its applications apply to evaluate the Maxima and Minima.**(BL2-Understand)** **CO3-** To apply the solution of the studied engineering problem from an application point of view.**(BL3-Apply)** **CO4-** To Analyse the real-world problems in field of Engineering like problems related to Solution of differential equations through successive differentiation, partial differentiation, integration and difference between scalar and vector quantity.**(BL4-Analyze)** **CO5-** To evaluate the derivatives (successive differentiation, and partial differentiation) as well as fundamentals and applications of Integral calculus including scalar and vector calculus.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	1	-	-	-	-	1	-	1
CO2	3	3	1	3	3	2	-	1	-	1	-	-	2	-	2
CO3	3	2	-	1	3	-	-	-	-	-	-	-	1	3	2
CO4	3	2	-	2	-	-	-	-	-	-	-	-	-	3	1
CO5	2	2	-	1	-	-	-	-	-	-	-	-	-	2	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Making of Modern India		
Course Code	MCL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** 1. : Students will gain a comprehensive understanding of India's historical evolution, including its cultural diversity, unity in diversity, accommodations, conflicts, and the role of the Indian intelligentsia. They will grasp how these factors shaped the idea of India, particularly in the context of British rule.**(BL2-Understand)** **CO2-** 2. : Students will critically analyze the development of Indian nationalism, exploring its anti-colonial basis, economic nationalism, communalism, revivalism, and the influences of Enlightenment values and European nationalism. They will understand the complex factors contributing to the emergence and growth of Indian nationalism.**(BL4-Analyze)** **CO3-** 3. Students will appreciate the significance of social reform movements in 19th-century India, understanding the contributions of key figures such as Raja Rammohan Roy and Swami Vivekananda. They will recognize the importance of addressing issues like women's rights and the caste system within the context of British rule and Indian introspection.**(BL5-Evaluate)** **CO4-** 4. : Students will understand the dynamics of the Indian National Movement, including early revolts, the 1857 revolt, the role of early nationalists, Gandhi-led mass movements, socialist and left trends, and the integration of princely states. They will comprehend the complexities and strategies involved in India's journey to independence. **(BL2-Understand)** **CO5-** 5. Students will analyze the trajectory of India after independence, examining the making of the Indian Constitution, the post-independent Nehru era, India's experiences facing wars, and its economic transition. They will evaluate India's achievements and challenges in the 21st century, gaining insights into its socio-economic and political landscape.**(BL3-Apply)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG10(Reduced inequalities) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	1	-	-	-	-	-	-	-	-	1	2	1
CO2	-	-	2	-	-	1	-	1	-	-	-	-	1	1	1
CO3	-	-	-	-	-	-	1	-	-	1	-	-	-	1	-
CO4	-	-	-	-	-	-	-	-	2	-	-	2	1	-	-
CO5	-	-	-	-	-	-	-	-	-	-	2	-	-	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Engineering Graphics		
Course Code	MEL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** To get the fundamentals of engineering graphics, geometrical construction and its applications.**(BL1-Remember)** **CO2-** To understand the basic concept of engineering graphics through real-life examples. **(BL2-Understand)** **CO3-** To implement the different engineering graphics concepts over appropriate drawing dataset. **(BL3-Apply)** **CO4-** To analyze the drawing performance of engineering graphics techniques.**(BL4-Analyze)** **CO5-** To evaluate the drawing performance of engineering graphics techniques on a corresponding object.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	2	-	2	2	1	2	-	-	3	3	-	-	3	2	2
CO3	-	-	2	1	1	-	-	-	2	1	-	-	3	2	2
CO4	-	1	2	3	1	-	-	-	-	-	-	-	3	-	2
CO5	-	1	1	2	1	-	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Engineering Physics		
Course Code	PHL0101[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember the concepts of Quantum Mechanics, Nanophysics, semiconductors, Optics, LASER and optical fiber. **(BL1-Remember)** **CO2-** To understand the basic concepts of Quantum Mechanics, Nanophysics, semiconductors, Optics, LASER and optical fiber.**(BL2-Understand)** **CO3-** To enable students to analyze salient features of Quantum Mechanics, Nanophysics, semiconductors, Optics, LASER and optical fiber.**(BL3-Apply)** **CO4-** To evaluate the applications of fundamentals of Quantum Mechanics, Nanophysics, semiconductors, Optics, LASER and optical fiber.**(BL4-Analyze)** **CO5-** To apply the understanding of Quantum Mechanics, Nanophysics, semiconductors, Optics, LASER and optical fiber.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	3	3	2	-	1	1	-	-	-	-	-
CO2	2	-	2	3	3	3	3	2	3	3	-	3	-	3	-
CO3	2	-	1	3	3	3	3	2	3	3	-	3	-	3	-
CO4	1	-	-	3	-	2	-	-	-	-	-	-	-	-	-
CO5	1	-	-	2	-	2	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	NCC		
Course Code	NCC0101[T]		
Course Outcomes & Bloom's Level	**CO1-** To Remember about the history of NCC, its organization, and incentives of NCC for their career prospects and the concept of national integration and its importance.**(BL1-Remember)** **CO2-** To Understand the concept of critical & creative thinking and the concept of self-awareness and emotional intelligence.**(BL2-Understand)** **CO3-** To Acquire knowledge of duties and conduct of NCC cadets.**(BL3-Apply)** **CO4-** To analyze the concept of team and its functioning.**(BL4-Analyze)** **CO5-** To Evaluate the process of decision making & problem solving.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG6(Clean water and sanitation) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Object Oriented Programming using Java		
Course Code	CSL0202[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember various syntax rules of java programming**(BL1-Remember)** **CO2-** To understand various Object-Oriented Concepts Exception handling, Multithreading, networking, and database connectivity techniques**(BL2-Understand)** **CO3-** To implement java AWT and applet and for GUI Programming and Event handling, java IO for Input and output handling, jdbc for database connectivity**(BL3-Apply)** **CO4-** To analyze various Error, and Database Handling techniques to learn how to improve the performance of the java application.**(BL4-Analyze)** **CO5-** To evaluate and compare the performance of various application Development techniques**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	2	1
CO2	1	2	1	1	2	2	-	-	-	3	-	-	2	3	3
CO3	2	1	1	-	1	-	-	-	-	1	-	-	3	2	3
CO4	1	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	1	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Basics of Electricals and Electronics Engineering		
Course Code	EEL0201[T]		
Course Outcomes & Bloom's Level	**CO1-** Analysis of Resistive Circuits and Solution of resistive circuits with independent sources**(BL1-Remember)** **CO2-** Analysis of Single Phase AC Circuits, the representation of alternating quantities and determining the power in these circuits. **(BL2-Understand)** **CO3-** Students will gain knowledge regarding various types' semiconductors**(BL3-Apply)** **CO4-** Student will gain knowledge on electronic systems.**(BL4-Analyze)** **CO5-** Student will gain knowledge digital electronics.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education) SDG11(Sustainable cities and economies)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	1	-	1	-	-	-	1	1	2	2	3
CO2	1	1	-	1	1	1	-	-	-	-	1	1	2	3	2
CO3	1	1	-	1	1	1	1	-	1	-	1	-	2	2	2
CO4	1	-	1	1	-	1	-	-	-	-	-	1	3	3	2
CO5	1	-	1	1	1	1	1	-	-	-	1	1	3	2	3
CO6	1	1	1	-	1	1	1	-	-	-	1	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Statistics for Engineers		
Course Code	MAL0201[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember basic concept of about the design data collection plans and basic tools of descriptive statistics.**(BL1-Remember)** **CO2-** To understand the identify relationship between two variables using scatter plot and Interpret a simple correlation. To understand the Knowledge about the different types of continuous distribution with their properties and applications.**(BL2-Understand)** **CO3-** To apply the test and make hypothesis by Student's t-test, F-test, chi-square test, Z test, goodness of fit.**(BL3-Apply)** **CO4-** To analyze the concept of sampling distribution of a statistic and its properties, difference between parameter and statistic.**(BL4-Analyze)** **CO5-** To evaluate and describe the properties of unbiasedness. Also identifying and provide an application the null hypothesis, alternative hypothesis and test statistic.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	1	-	-	-	-	1	-	1
CO2	3	3	1	3	3	2	-	1	-	1	-	-	2	-	2
CO3	3	2	-	1	3	-	-	-	-	-	-	-	1	3	2
CO4	3	2	-	2	-	-	-	-	-	-	-	-	-	3	1
CO5	2	2	-	1	-	-	-	-	-	-	-	-	-	2	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Environmental Science & Global Issues		
Course Code	MCL0201[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember the concept of different types of environmental challenges and associated technologies and measures to control it.**(BL1-Remember)** **CO2-** Develop environmental scientists and engineers and sensitize them towards environmental issues.**(BL2-Understand)** **CO3-** To acquire analytical skills in assessing environmental impacts through a multidisciplinary approach**(BL3-Apply)** **CO4-** Ability to distinguish between various methods of various pollution analysis**(BL4-Analyze)** **CO5-** Acquire expertise and skills needed for the Environmental Management Systems and techniques of monitoring, Environment audit, Environmental Impact Analysis, environment instrumentation and control systems and for the projects development, implementation, and maintenance. They also able to develop projects in view of Socio Cultural and behavioral aspects of Energy production and environmental changes The trained manpower in Environmental and Waste Management provide the environmental Auditors/ Managers/Consultants.**(BL5-Evaluate)** **CO6-** Students acquire skills for to communicate, prepare, plan and implement the environmental management project**(BL6-Create)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✓	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	1	2	3	1	2	1	1	2	1	3	3
CO2	-	-	-	-	-	-	2	-	-	-	-	-	1	-	1
CO3	1	-	-	2	2	-	-	-	-	-	-	-	1	2	2
CO4	-	-	-	-	-	3	3	2	-	-	1	-	1	2	-
CO5	-	-	-	-	-	-	-	1	-	-	-	-	1	2	3
CO6	-	-	-	-	-	-	-	1	-	-	-	-	1	2	3

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Engineering Mechanics		
Course Code	MEL0201[T]		
Course Outcomes & Bloom's Level	**CO1-** CO1 Remember the basics of sciences in effects of system of forces on rigid bodies in static and kinetic conditions**(BL1-Remember)** **CO2-** CO2 Understand the basics of sciences in effects of system of forces on rigid bodies in static and kinetic conditions.**(BL2-Understand)** **CO3-** CO3 Apply system of forces in the belts drive systems as power transmission devices, shafts and beams.**(BL3-Apply)** **CO4-** CO4 Analyze the beams and trusses with centre of mass and moment of inertia. **(BL4-Analyze)** **CO5-** CO5 Evaluate shear force and bending moment in designing of shafts and beams and trusses.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	1	-	-	1	1	1	1	1	1
CO2	3	3	1	1	-	1	3	-	1	1	1	2	1	1	1
CO3	3	3	3	2	2	2	1	2	1	-	1	2	1	1	1
CO4	3	3	2	3	2	2	1	-	1	1	2	2	2	2	2
CO5	3	3	3	3	2	2	2	2	2	3	3	3	3	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Web Technology		
Course Code	CSP0201[P]		
Course Outcomes & Bloom's Level	**CO1-** To remember various Web Development Strategies and syntax rules of web Programming**(BL1-Remember)** **CO2-** : To understand the basics of web architecture, Types of architecture, knowledge about web protocols and web development tools**(BL2-Understand)** **CO3-** To implement: HTML, CSS, Javascript and XML web designing language to create Web pages. **(BL3-Apply)** **CO4-** To analyze various Client-side programming techniques and compare various HTMl versions**(BL4-Analyze)** **CO5-** To evaluate the web pages and layout with the help of Advanced CSS Techniques**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG2(Zero hunger) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	3	2	2
CO2	2	3	1	-	-	-	-	-	-	-	-	2	2	2	1
CO3	2	3	1	-	-	-	-	-	-	-	-	2	2	3	1
CO4	3	3	1	-	-	-	-	-	-	-	-	2	2	3	1
CO5	2	1	-	-	-	-	-	-	2	-	-	2	3	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	*NCC		
Course Code	NCC-0202[T]		
Course Outcomes & Bloom's Level	**CO1-** Define thinking, reasoning, critical thinking and creative thinking.**(BL1-Remember)** **CO2-** To think critically about different life related issues.**(BL2-Understand)** **CO3-** Think divergently and will try to break functional fixedness.**(BL3-Apply)** **CO4-** Creatively in their real-life problems.**(BL4-Analyze)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Operating System		
Course Code	CSL0301[T]		
Course Outcomes & Bloom's Level	**CO1-** CO.1 Revisiting the Von Neumann architecture concept of Operating System and its role, Booting of a system, OS types, basics of operating systems like kernel, shell. Recall the programming concepts, Memory, Storage.**(BL1-Remember)** **CO2-** CO.2 Understand the functions of operating systems, its architecture, concept of process, role of OS in Process Scheduling and performance parameters used for Scheduling, Importance and need of Synchronization. Need of Memory and storage management and techniques to avoid Deadlocks in a system.**(BL2-Understand)** **CO3-** CO.3 Apply the OS concepts to learn the techniques of process management, process scheduling, memory management, Process synchronization, Storage management, Deadlocks in a system and their solutions. **(BL3-Apply)** **CO4-** CO.4 Analyze the scheduling algorithms, Synchronization algorithms and their implementations, memory and storage management techniques and their working, Concepts used for Deadlock Avoidance and prevention**(BL4-Analyze)** **CO5-** CO.5 Evaluating the performance of scheduling algorithms, Synchronization techniques, Memory management algorithms, storage management algorithms and deadlock handling techniques and conclude on quality with the observations based on performance parameters.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	2	1
CO2	1	2	-	2	2	2	-	-	-	2	-	-	2	-	3
CO3	2	1	-	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	2	2	-	2	2	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Data Structures		
Course Code	CSL0302[T]		
Course Outcomes & Bloom's Level	**CO1-** Understanding: comprehensive knowledge of the data structures;**(BL2-Understand)** **CO2-** Applying: understand the importance of data and be able to identify the data requirements for an application;**(BL3-Apply)** **CO3-** Analyzing: have a practical experience of algorithmic design and implementation; **(BL4-Analyze)** **CO4-** Evaluating: practical experience of developing applications that utilize data structures and evaluating the performances of applications;**(BL5-Evaluate)** **CO5-** Creating: develop projects requiring the implementation of various data structures**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	3	2	2
CO2	2	3	1	-	-	-	-	-	-	-	-	2	2	2	1
CO3	2	3	1	-	-	-	-	-	-	-	-	2	2	3	1
CO4	3	3	1	-	-	-	-	-	-	-	-	2	2	3	1
CO5	2	1	-	-	-	-	-	-	2	-	-	2	3	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Software Engineering		
Course Code	CSL0303[T]		
Course Outcomes & Bloom's Level	**CO1-** Understand the basics of software engineering like characteristic, crisis of software and process of software engineering systems (Knowledge, Understand)**(BL2-Understand)** **CO2-** Apply the various SDLC, ER, DFD models, to collect SRS, And understand the software. (Apply).**(BL3-Apply)** **CO3-** Design the Design Strategies, Architectural Design concept for better development of software (Design).**(BL6-Create)** **CO4-** Explain various testing techniques and Analyze the concept of testing strategies (Analysis)**(BL4-Analyze)** **CO5-** Evaluating the need of Software Maintenance and Software Project Management Software, Need for Maintenance, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re- Engineering, Reverse Engineering and other inter process communication tech An Overview of CASE Tools, Constructive Cost Models (COCOMO), Software Risk Analysis and Management. (Investigation).**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	1	-	-	-	-	-	-	-	1	-	2
CO2	1	-	-	-	1	2	-	-	-	-	-	-	1	2	3
CO3	2	1	-	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	3	1	-	-	-	-	-	-	-	3	2	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO6	1	1	2	3	2	2	-	-	-	2	-	-	3	3	3

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Digital Electronics		
Course Code	ECL0305[T]		
Course Outcomes & Bloom's Level	**CO1-** To learn basic techniques and fundamental concepts for the design of digital systems.**(BL1-Remember)** **CO2-** To grasp the knowledge of common forms of number system representation and understand the conversions of numbers in digital electronic. **(BL2-Understand)** **CO3-** Apply logical operations to solve general problems (Addition, subtraction, multiplication) of mathematics. **(BL3-Apply)** **CO4-** To analyzed and evaluated the output of combinational circuits for different operations and with the help of concepts of Boolean algebra and logic family analyze sequential systems in terms of state machines.**(BL4-Analyze)** **CO5-** To design combinational logic circuits, sequential logic circuits for specific purpose. **(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	1	2	-	-	-	3	-	-	-	-	-
CO2	1	2	1	-	1	2	-	-	-	3	-	-	-	-	2
CO3	1	2	1	-	-	-	-	-	-	-	-	-	-	-	3
CO4	1	3	1	-	-	-	-	-	-	-	-	-	-	-	3
CO5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Discrete Structure and Matrices		
Course Code	MAL0305[T]		
Course Outcomes & Bloom's Level	**CO1-** Learn about Sets, Relation, function, partially ordered sets, lattices and their types. **(BL1-Remember)** **CO2-** Understand Boolean algebra and Boolean functions, logic gates, switching circuits and their applications.**(BL2-Understand)** **CO3-** Solve real-life problems using finite-state and Turing machines**(BL3-Apply)** **CO4-** Assimilate various graph theoretic concepts and familiarize with their applications. **(BL4-Analyze)** **CO5-** To learn the importance of linear transformation in Physics, Engineering, Social sciences and various branches of Mathematics.**(BL5-Evaluate)** **CO6-** To learn to find Eigen values and Eigen vectors of a matrix which is used in the study of vibrations, chemical reactions and geometry.**(BL3-Apply)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	-	-	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	-	-	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	-	-	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	-	-	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	**Seminar		
Course Code	CSD0301[P]		
Course Outcomes & Bloom's Level	**CO1-** CO1: Apply theoretical knowledge from coursework to solve real-world industry problems. (e.g., utilize marketing principles to develop a campaign for a local business) **(BL3-Apply)** **CO2-** CO2: Demonstrate proficiency in industry-standard tools and technologies relevant to the internship field. (e.g., use design software to create graphics for a company website) **(BL4-Analyze)** **CO3-** CO3: Analyze and interpret data collected during the internship experience. (e.g., analyze customer feedback to improve product design)**(BL4-Analyze)** **CO4-** CO4: Enhance critical thinking skills by analyzing and evaluating the outcomes of assigned projects or tasks.**(BL5-Evaluate)** **CO5-** CO5: Compile a comprehensive report documenting the learning experiences, challenges, and achievements during the internship period.**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth) SDG9(Industry Innovation and Infrastructure)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Python Programming		
Course Code	CSP0304[P]		
Course Outcomes & Bloom's Level	**CO1-** To remember the basic programming concept**(BL1-Remember)** **CO2-** Understand the basics of Python like python origin downloading and installing and basic concept of python**(BL2-Understand)** **CO3-** Apply the various conditional and looping statement and functional programming. **(BL3-Apply)** **CO4-** Explain various objects numbers and sequence in python Analyze the concept of regular expression.**(BL4-Analyze)** **CO5-** Evaluate the concept of object-oriented programming for better utilization of language.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	1	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	2	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	3	1	-	-	-	-	-	-	-	3	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	*NCC		
Course Code	NCC-0303[T]		
Course Outcomes & Bloom's Level	**CO1-** Define thinking, reasoning, critical thinking and creative thinking.**()** **CO2-** To think critically about different life related issues.**()** **CO3-** Think divergently and will try to break functional fixedness.**()** **CO4-** Creatively in their real-life problems**()** **CO5-** Understand the organizations related to disaster management and Their functioning.**()** **CO6-** Appreciate the role of NCC cadets in disaster management.**()**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG4(Quality education) SDG6(Clean water and sanitation) SDG13(Climate action) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Data Communication and Computer Networks		
Course Code	CSL0402[T]		
Course Outcomes & Bloom's Level	**CO1-** CO1: Remembering the concepts of computer networks, their types.**(BL1-Remember)** **CO2-** CO2: Understand to the concept of Classfull and Classless addressing Network address Translation, Mobile IP.**(BL2-Understand)** **CO3-** CO3:Apply to analyses Translation, Encryption, Compression. Application Layer Protocols & Services: (Apply)**(BL3-Apply)** **CO4-** CO4: Analyze the applications to address the issues of Networking Technologies. **(BL4-Analyze)** **CO5-** CO5: Evaluating to investigate routers, IP and Routing Algorithms in Network Layer. **(BL5-Evaluate)** **CO6-** CO6: Create and designTocreate networking models to using cisco packet tracer in networking simulator**(BL6-Create)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	1	1	2
CO2	1	-	-	-	2	-	-	-	-	-	-	-	3	2	2
CO3	2	-	-	-	1	-	2	-	-	-	-	-	3	2	2
CO4	-	-	-	2	2	2	-	2	-	-	1	1	2	2	2
CO5	-	-	1	-	-	2	-	1	-	-	-	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Database Management System		
Course Code	CSL0403[T]		
Course Outcomes & Bloom's Level	**CO1-** Understand basic concepts of query writing, and transaction management and identify various data models (ER modeling concepts) for designing a good database **(BL1-Remember)** **CO2-** Apply relational database theory and describe relational algebra expression, tuple, and domain relation expression for writing queries in relational algebra and SQL.**(BL2-Understand)** **CO3-** Analyze the quality of the database using normalization techniques, conflict scenarios using concurrent processing techniques, and analyze various transaction serialization scenarios**(BL3-Apply)** **CO4-** Evaluate and improve the database design by applying normalization, key constraints, and other constraints.**(BL4-Analyze)** **CO5-** Design a real database application using Database Management approaches**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		-	-	2	-	-	-	-	2	-	-	1	-	1
CO2	3	3	1	2	2	-	-	-	-	3	-	-	2	-	3
CO3	2	2	1	-	2	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	1	1	-	-	-	-	-	-	-	3	3	3
CO5	1	2	-	1	1	-	-	-	-	-	-	-	3	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Computer System Organization		
Course Code	CSL0404[T]		
Course Outcomes & Bloom's Level	**CO1-** Understand the basics of computer system and its architecture with architecture of 16-bit microprocessor**(BL2-Understand)** **CO2-** Apply the concepts learned in designing of memory and other sequential circuits. **(BL3-Apply)** **CO3-** Analyze the concept of designing of hardware logics that makes a computer system functional**(BL4-Analyze)** **CO4-** Evaluating the working and performance of the implemented hardware and comment on its efficiency**(BL5-Evaluate)** **CO5-** Create and design various hardware and software logics to make a computer system like ALU, Memory, Bus, etc**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	1	-	-	-	-	-	-	-	2	1	2
CO2	1	2	1	1	2	-	-	-	-	-	-	-	2	3	3
CO3	2	1	1	1	2	-	-	-	-	-	-	-	2	3	3
CO4	2	1	1	2	2	-	-	-	-	-	-	-	2	2	3
CO5	2	1	1	2	1	-	-	-	-	-	-	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Personality Development & Communication Skills		
Course Code	HUL0401[T]		
Course Outcomes & Bloom's Level	**CO1-** To understand the concept, process and importance of communication.**(BL1-Remember)** **CO2-** To gain knowledge of media of communication.**(BL2-Understand)** **CO3-** To develop skills of effective communication both written and oral.**(BL3-Apply)** **CO4-** To help students to acquaint with application of communication skills in the world of business.**(BL4-Analyze)** **CO5-** To understand the concept of personality and personality development and its significance.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	2	-	-	3	-	-	-	-	2	1	-
CO2	2	3	-	-	-	-	-	-	1	-	-	-	-	-	3
CO3	2	-	3	-	-	-	-	-	-	-	-	-	2	3	-
CO4	2	1	3	-	3	-	-	-	3	-	-	-	1	-	3
CO5	3	-	3	-	-	-	-	2	-	-	-	-	2	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Numerical Methods using Programming & Number Theory		
Course Code	MAL0409[T]		
Course Outcomes & Bloom's Level	**CO1-** To get insight of fundamental knowledge of numerical methods and Number theory. **(BL1-Remember)** **CO2-** To understand various techniques to solve real life problems through examples. **(BL2-Understand)** **CO3-** To implement various methods over sets and equations. **(BL3-Apply)** **CO4-** To analyze behavior of sets, numerical solution of equations and congruence equations. **(BL4-Analyze)** **CO5-** To evaluate rate of convergence, error of equations based on mathematical techniques and nature of numbers.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	1	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	1	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Universal Human Values		
Course Code	MCL0402[T]		
Course Outcomes & Bloom's Level	**CO1-** CO1: To help the students appreciate the essential complimentarily between "VALUES" and "SKILLS" to ensure sustained happiness and prosperity which are the core aspirations of all human beings.**(BL2-Understand)** **CO2-** CO2: To facilitate the development of a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the human reality and the rest of existence. **(BL2-Understand)** **CO3-** CO3: To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and enriching interactions with nature. **(BL3-Apply)** **CO4-** CO4: To provide a much-needed orientation input in value education to the young enquiring minds.**(BL4-Analyze)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG10(Reduced inequalities) SDG16(Peace Justice and strong institutions)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	-	-	-	2	-	-	1	1	1	2
CO2	-	2	-	-	-	-	-	-	-	-	2	2	1	2	-
CO3	1	-	-	-	-	-	-	-	2	-	-	1	-	1	1
CO4	-	2	-	-	-	-	-	-	-	-	2	2	1	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Advance Java		
Course Code	CSP0406[P]		
Course Outcomes & Bloom's Level	**CO1-** To remember the OOPS Concept of java programming and syntax rules. **(BL1-Remember)** **CO2-** To understand java Enterprise Edition, MVC model, and various techniques for web applications development**(BL2-Understand)** **CO3-** To implement Swing, servlet .jsp, jdbc, and session handling techniques to learn the development of a real-world web application**(BL3-Apply)** **CO4-** To analyze the performance of applications using Exception handling techniques**(BL4-Analyze)** **CO5-** To evaluate the efficiency of various application development techniques for web application development **(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	2	1
CO2	1	2	1	1	2	2	-	-	-	3	-	-	2	3	3
CO3	2	1	1	-	1	-	-	-	-	1	-	-	3	2	3
CO4	1	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	1	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	*NCC / **MOOC		
Course Code	NCC-0404[T]		
Course Outcomes & Bloom's Level	**CO1-** Develop the qualities of social skills.**()** **CO2-** Imbibe leadership qualities. **()** **CO3-** Be motivated to serve the nation by joining Armed forces. **()** **CO4-** Contribute in environmental awareness and conservation activities**()** **CO5-** Keep abreast of current affairs & general awareness.**()** **CO6-** Effectively contribute in managing disaster relief tasks**()**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG13(Climate action) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Artificial Intelligence		
Course Code	CSL0501[T]		
Course Outcomes & Bloom's Level	**CO1-** Remember**(BL1-Remember)** **CO2-** understand**(BL2-Understand)** **CO3-** Analyze**(BL4-Analyze)** **CO4-** Evaluate**(BL5-Evaluate)** **CO5-** Create**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	1	2	-	-	-	2	-	-	1	-	1
CO2	2	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	2	2	2	2	-	-	-	-	-	-	-	2	2	3
CO4	-	2	-	3	1	-	-	-	-	1	-	-	2	3	3
CO5	1	1	-	2	-	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Theory of Computation	
Course Code	CSL0502[T]	
Course Outcomes & Bloom's Level	**CO1-** To remember comprehensive background in underlying concepts and techniques used in Theory of Computation.**(BL1-Remember)** **CO2-** To understand the basics of Automata theory, Finite Automata, DFA, NFA, Panda Turing Machine.**(BL2-Understand)** **CO3-** To implement the Automata, Moore and Mealy machines, Decision Algorithms, push down automata, Turing Machines**(BL3-Apply)** **CO4-** To analyze the concepts of DFA, NFA, syntax tree in phases of Compiler and decidability with Turing machine**(BL4-Analyze)** **CO5-** To evaluate the mathematical and logical models that run efficiently**(BL5-Evaluate)**	
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	2	-	-	-	-	2	-	-	1	2	1
CO2	2	3	-	2	2	-	-	-	-	3	-	-	2	-	3
CO3	1	2	-	1	2	-	-	-	-	-	-	-	2	3	3
CO4	-	2	-	-	2	-	-	-	-	-	-	-	2	3	3
CO5	-	-	-	-	2	-	-	-	-	-	-	-	1	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Design and Analysis of Algorithm	
Course Code	CSL0503[T]	
Course Outcomes & Bloom's Level	**CO1-** Recognize the complexity of algorithms by Describing various data structures and their representations in memory with their common applications**(BL1-Remember)** **CO2-** Understand the basic concepts of algorithm representation techniques such as Pseudo codes and Flowcharts and Compare between different data structures to pick an appropriate data structure for a design situation.**(BL2-Understand)** **CO3-** Apply different algorithm designing techniques to solve the real-world problems. **(BL3-Apply)** **CO4-** Analyze the time and space complexity of the different algorithm design techniques for a given problem.**(BL4-Analyze)** **CO5-** Examine computational problems into P, NP, NP-Hard and NP complete**(BL5-Evaluate)**	
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	2	2	-	-	-	-	-	-	-	2	2	2
CO2	2	2	1	3	2	-	-	-	-	-	-	-	2	3	2
CO3	2	2	2	2	1	-	-	-	-	-	-	-	3	3	3
CO4	1	2	1	2	1	-	-	-	-	-	-	-	2	3	3
CO5	1	1	-	-	-	-	-	-	-	-	-	-	2	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Seminar II		
Course Code	CSD0502[P]		
Course Outcomes & Bloom's Level	**CO1-** CO1: Apply theoretical knowledge from coursework to solve real-world industry problems. (e.g., utilize marketing principles to develop a campaign for a local business) **(BL3-Apply)** **CO2-** CO2: Demonstrate proficiency in industry-standard tools and technologies relevant to the internship field. (e.g., use design software to create graphics for a company website) **(BL4-Analyze)** **CO3-** CO3: Analyze and interpret data collected during the internship experience. (e.g., analyze customer feedback to improve product design)**(BL4-Analyze)** **CO4-** CO4: Enhance critical thinking skills by analyzing and evaluating the outcomes of assigned projects or tasks.**(BL5-Evaluate)** **CO5-** CO5: Compile a comprehensive report documenting the learning experiences, challenges, and achievements during the internship period.**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth) SDG9(Industry Innovation and Infrastructure)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Introduction to Data Science	
Course Code	CSE0521[T]	
Course Outcomes & Bloom's Level	**CO2-** Understand the importance of and be able to formulate a data analysis problem statement that is clear, concise, and measurable**(BL1-Remember)** **CO3-** Apply appropriate descriptive and inferential methods to summarize data and identify associations and relationships**(BL2-Understand)** **CO4-** Apply appropriate tools and technology to collect, process, transform, summarize, and visualize data**(BL3-Apply)** **CO5-** Analyze Effectively communicate methods and findings in a variety of modes..**(BL4-Analyze)** **CO6-** Analyze categorical and/or numerical data types in a given data set**(BL5-Evaluate)**	
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	1	-	-	1	-	-	1	1	1	-	-	-
CO2	1	-	1	-	1	-	-	-	1	1	1	-	-	-	-
CO3	1	1	1	1	-	-	-	-	-	1	1	1	-	-	-
CO4	1	1	1	1	1	-	1	-	1	-	1	1	-	-	-
CO5	1	1	1	-	1	-	1	-	1	-	1	1	-	1	-
CO6	-	-	-	1	-	1	-	1	-	1	-	1	-	1	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Data Mining and Data Warehousing		
Course Code	CSE0522[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember the Data mining techniques that help extract meaningful data.**(BL1-Remember)** **CO2-** To understand the basics of Data warehouse, Data marts, data preprocessing and techniques of data mining.**(BL2-Understand)** **CO3-** To implement the various methods of data mining for data clustering, classification: K-means, K- Medoids etc.**(BL3-Apply)** **CO4-** To analyze the concepts of data Preprocessing, Association Rule Mining, classification, clustering.**(BL4-Analyze)** **CO5-** To evaluate the data mining models that run efficiently.**(BL5-Evaluate)** **CO6-** To create the dominant data mining algorithms; demonstrate an appreciation of the importance of paradigms from the fields of Artificial Intelligence and Machine Learning to data mining; explore the developing areas - web mining, text mining etc.**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	-	1	1	2	2	2	-	-	-	-	-	-	1	-	-
CO3	2	-	-	-	-	-	-	-	-	-	-	-	1	2	3
CO4	2	1	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Linear Algebra		
Course Code	MAL0509[T]		
Course Outcomes & Bloom's Level	**CO1-** To get insight of fundamental knowledge of matrix, group theory and transformations **(BL1-Remember)** **CO2-** To understand various techniques to solve real life problems through examples in light of computer science and engineering and related field of CSE**(BL2-Understand)** **CO3-** To apply concepts of matrix, vector space, linear transformation and inner product space in computer science and engineering.**(BL3-Apply)** **CO4-** To analyze properties of matrix, vectors, vector spaces and linear transformations with the application in computer science and related branches.**(BL4-Analyze)** **CO5-** To evaluate Inverse, Eigen value and Eigen vector of matrix and orthonormal vectors/basis. **(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	1	-	-	-	-	1	-	1
CO2	3	3	1	3	3	2	-	1	-	1	-	-	2	-	2
CO3	3	2	-	1	3	-	-	-	-	-	-	-	1	3	2
CO4	3	2	-	2	-	-	-	-	-	-	-	-	-	3	1
CO5	2	2	-	1	-	-	-	-	-	-	-	-	-	2	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Big Data		
Course Code	CSE0511 [T]		
Course Outcomes & Bloom's Level	**CO1-** CO1: To understand the fundamentals of Big Data.**(BL2-Understand)** **CO2-** CO2: To know about the different tools for Big Data and Visualization.**(BL2-Understand)** **CO3-** CO3: To explore tools and practices for big data and Visualization. **(BL3-Apply)** **CO4-** CO4: To recognize the role of business intelligence and visualization in decision making.**(BL4-Analyze)** **CO5-** CO5: To analyze data using Power BI, Tableau etc.**(BL5-Evaluate)** **CO6-** CO6: To prepare design dashboard for presenting analytics from data. **(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	-	2	-	-	2	-	-	1	-	-
CO2	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	1	-	-	-	-	-	-	-	1	-	-
CO4	2	1	-	2	-	-	-	-	-	-	-	-	1	2	-
CO5	2	2	-	-	-	-	-	-	-	-	-	-	2	3	-
CO6	1	-	1	-	-	-	-	-	-	-	-	-	2	2	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Cryptography		
Course Code	CSE0512[T]		
Course Outcomes & Bloom's Level	**CO1-** : Remembering/Revising the basics of computer system, Computer networks and network security**(BL1-Remember)** **CO2-** : Understand the Cryptography and Encryption techniques and the concepts of Hashing **(BL2-Understand)** **CO3-** : Apply the various Symmetric and Asymmetric Key Encryption algorithms**(BL3-Apply)** **CO4-** : Explain the various Encryption and Hashing techniques and analyze the concept of Digital Signatures, IP Security**(BL4-Analyze)** **CO5-** : Evaluating the various methods of Cryptography, Hash functions, Substitution and Transposition techniques**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	1	-	1	1	-	-	-	-	-	-	-	1	-	1
CO2	-	1	2	-	3	-	-	1	-	-	-	-	1	-	2
CO3	-	1	-	-	1	-	-	1	-	-	-	-	3	-	3
CO4	-	-	-	-	1	-	1	-	-	-	-	-	2	1	2
CO5	-	1	-	-	2	2	1	-	-	-	-	-	2	2	2
CO6	-	-	-	-	1	-	-	-	-	-	-	-	1	1	1

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Blockchain Technology
Course Code	CSE0513 [T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)** **CO6-** To prepare a scenario to observe the performance evaluation of blockchain in comparison to contemporary technologies and to observe the potential application areas**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	2	1	-	2	-	-	-	-	-	-	2	1	3
CO2	-	1	2	1	1	-	-	-	-	-	-	-	1	2	-
CO3	-	1	2	1	1	2	-	-	-	-	-	-	1	2	1
CO4	-	-	1	-	-	1	-	-	-	-	-	-	2	1	1
CO5	-	2	2	-	1	2	-	-	-	-	-	-	1	2	3
CO6	-	2	1	-	1	-	-	-	-	-	-	-	1	2	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	NCC / **MOOC		
Course Code	NCC-0505[T]		
Course Outcomes & Bloom's Level	**CO1-** Participate in team building exercise and value team work.**()** **CO2-** Improve communication skills by public speaking activities. **()** **CO3-** Understand the security mechanism and management of Border/Coastal areas. **()** **CO4-** Get motivated to join armed forces.**()**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG3(Good health and well-being) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Cloud Computing		
Course Code	CSE0602[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember the various technologies for information storage and management. **(BL1-Remember)** **CO2-** To understand the storage techniques, concepts of data center, data center infrastructure management and services. **(BL2-Understand)** **CO3-** To implement the setup of storage techniques such as RAID, LUN Masking at data center. Create the virtual server and virtualize the resources as on demand.**(BL3-Apply)** **CO4-** To analyze the functionality of data center or storage infrastructure as per policies. **(BL4-Analyze)** **CO5-** To evaluate the performance of data center or storage infrastructure on various performance parameters. **(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG3(Good health and well-being) SDG4(Quality education) SDG8(Decent work and economic growth) SDG9(Industry Innovation and Infrastructure) SDG10(Reduced inequalities)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	1	2	1
CO2	1	1	-	-	1	-	3	-	-	-	-	2	2	2	1
CO3	1	2	2	2	2	-	3	-	-	-	-	2	3	3	2
CO4	1	3	2	2	2	-	2	-	-	-	-	2	3	2	2
CO5	-	3	2	2	2	-	2	-	2	-	-	2	3	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Internet of Things		
Course Code	CSL0601[T]		
Course Outcomes & Bloom's Level	**CO1-** Understand the working of devices in a Internet based network Also architecture of IoT as a system (Knowledge, Understand)**(BL1-Remember)** **CO2-** Apply the IoT communication model and its protocols for establishing IoT network and device communication. (Apply).**(BL2-Understand)** **CO3-** Analyze the analyze various Physical Computing Techniques. (Analysis)**(BL3-Apply)** **CO4-** Evaluating the working and performance of hardware in a network and its data communication. (Investigation).**(BL4-Analyze)** **CO5-** Create and design dynamic web applications using web Controls and validation controls. (Design)**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	-	-	-	-	-	-	-	-	-	2	2	1
CO2	-	2	2	-	-	-	-	-	-	-	-	-	3	2	1
CO3	-	2	3	-	-	-	-	-	-	-	-	-	2	2	1
CO4	-	-	1	-	-	-	-	-	-	-	-	-	3	1	2
CO5	-	2	1	-	-	-	-	-	-	-	-	-	2	2	1
CO6	-	-	1	-	-	-	-	-	-	-	-	-	3	2	1

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Principles of Management and managerial economics		
Course Code	HUL0602[T]		
Course Outcomes & Bloom's Level	**CO1-** The students will be able to comprehend the concepts of Management.**(BL1-Remember)** **CO2-** Students will understand the managerial functions and their importance in attaining organizational goals.**(BL2-Understand)** **CO3-** The students will develop an understanding to make business decisions in different business situations.**(BL3-Apply)** **CO4-** Students will analyze the concept of utility, consumer equilibrium, indifference curves, and demand concepts.**(BL4-Analyze)** **CO5-** The students will evaluate the role and responsibilities of managers.**(BL5-Evaluate)** **CO6-** The students will understand market structures and analyze market demand.**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG12(Responsible consuption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	1	-	-	-	-	-	-	-	-	1	-	1
CO2	-	2	1	-	-	-	-	-	-	-	-	-	-	2	1
CO3	1	1	3	-	-	-	-	-	-	-	-	-	1	3	-
CO4	2	1	1	1	-	-	-	-	-	-	-	-	-	2	1
CO5	1	-	2	1	-	-	-	-	-	-	-	-	1	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Minor Project - I		
Course Code	CSD0603		
Course Outcomes & Bloom's Level	**CO1-** CO1: Conduct in-depth research and critically analyze existing solutions in the chosen project area within computer science or information technology. (Evaluate)iples to develop a campaign for a local business)**(BL3-Apply)** **CO2-** CO2: Design a novel and comprehensive software solution using appropriate programming languages, frameworks, and tools. (Design)**(BL4-Analyze)** **CO3-** CO3: Implement the designed solution effectively, demonstrating core functionalities and addressing potential limitations. (Develop)**(BL4-Analyze)** **CO4-** CO4: Apply advanced software engineering principles, project management principles, and design patterns to ensure the solution is robust, scalable, and maintainable in the long term. (Design)**(BL5-Evaluate)** **CO5-** CO5: Utilize database management systems or advanced programming paradigms (e.g., object-oriented, functional, concurrency control) to enable efficient data storage, retrieval, and manipulation within the solution or to optimize the solution's efficiency and performance. (Develop)**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Data Analytics & Visualization	
Course Code	CSE0622[P]	
Course Outcomes & Bloom's Level	**CO2-** CO:1 To understand the Basic concept of Data science, application areas and tools required for data science**(BL1-Remember)** **CO3-** CO2: To Explore the functionality of various data science libraries(Numpy, Pandas, Matplotlib etc.) required to process the data.**(BL2-Understand)** **CO4-** CO3: To Apply various data preprocessing methods to make datasets suitable for Data analysis.**(BL3-Apply)** **CO5-** CO4: To Analyze the datasets of different domains using statistical methods & visualization tools.**(BL4-Analyze)** **CO6-** CO5: To Create datasets for real world problems**(BL6-Create)**	
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	-	1	1	1	-	-	-	-	-	-	-	1
CO2	-	1	-	1	1	-	1	-	1	-	1	-	-	-	1
CO3	1	1	-	-	1	1	-	1	-	1	-	-	-	-	-
CO4	1	1	-	-	1	-	1	-	1	-	1	-	1	-	1
CO5	-	-	-	-	1	1	1	-	1	-	1	-	1	-	1
CO6	-	1	-	1	-	1	-	1	-	1	-	1	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Essentials of Digital Forensics		
Course Code	CSE0621[T]		
Course Outcomes & Bloom's Level	**CO1-** To learn basic components, Techniques and principles of Digital forensic analysis and tools used for forensic analysis.**(BL1-Remember)** **CO2-** Understanding the methods and procedures of forensic analysis of various components of the cyber space such as memory forensic, disk forensic, network forensic and web forensic**(BL2-Understand)** **CO3-** Apply forensic investigation process learned in solving a hypothetical/ real case of cybercrime using forensic tools**(BL3-Apply)** **CO4-** Use various forensic tools to analyze the state of disk, network, memory and other artifacts acquired from the victim machine or its environment as well as malware if found. **(BL4-Analyze)** **CO5-** : Evaluating a computer system for digital hygiene against the security policy of an organization / setup.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	2	-	-	-	-	-	-	-	-	2	1	1
CO2	-	1	1	1	2	-	-	-	-	-	-	-	1	2	1
CO3	2	2	1	1	2	-	-	-	-	-	-	-	3	2	3
CO4	-	2	1	2	-	-	-	-	-	-	-	-	2	1	3
CO5	2	2	1	-	1	-	-	-	-	-	-	-	1	2	2
CO6	-	3	-	2	-	-	-	-	-	-	-	-	1	2	3

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Soft Computing		
Course Code	CSE0623[T]		
Course Outcomes & Bloom's Level	**CO1-** To remember various concept of soft computing.**(BL1-Remember)** **CO2-** To understand the basic concept of artificial neural networks, fuzzy sets, fuzzy logic and genetic algorithms**(BL2-Understand)** **CO3-** Implementation of various supervised and unsupervised learning algorithms and optimization techniques.**(BL3-Apply)** **CO4-** To Analyze various soft computing algorithms and techniques.**(BL4-Analyze)** **CO5-** To evaluate the state of the art of artificial neural networks, fuzzy logic and genetic algorithms.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies) SDG12(Responsible consuption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	-	2	-	-	1	2	3
CO2	3	1	1	2	2	2	-	-	-	2	-	-	1	2	3
CO3	2	2	-	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO5	1	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Compiler Design		
Course Code	CSE0611[T]		
Course Outcomes & Bloom's Level	**CO1-** Understand the basics of Translation Process, Translators such as compiler, Interpreter and Assembler (Knowledge, Understand)**(BL1-Remember)** **CO2-** Apply the various Error handling techniques on various phases of compiler to remove various types of errors, various code optimization techniques for optimizing inefficient codes. (Apply).**(BL2-Understand)** **CO3-** Explain various analysis and design phases of the compiler and their working principle with suitable examples. (Analysis)**(BL3-Apply)** **CO4-** Design the various Compiler construction tools such as LEX for Lexical Analysis and YACC for LALR Parsing for automation of Token generation and parse tree creation (Design)**(BL4-Analyze)** **CO5-** Evaluating the various types of Top-Down and Bottom-Up Parsing Techniques such as LL (1), LR and Operator Precedence Parsing. Various methods used for intermediate code generation such as Three address codes (Investigation).**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	-	-	1	-	-	-	-	-	-	1	2	3
CO2	-	1	-	-	-	3	-	-	-	-	-	-	2	1	2
CO3	-	3	1	-	-	2	-	-	-	-	-	-	1	2	2
CO4	1	-	2	-	-	-	-	-	-	-	-	-	3	2	1
CO5	-	-	-	3	-	-	-	-	-	-	-	-	1	1	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Quantum Computing
Course Code	CSE0612[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	1	1	2	-	-	-	-	-	-	-	2	2	2
CO2	2	1	2	2	1	-	-	-	-	-	-	-	1	2	1
CO3	-	2	1	2	1	-	-	-	-	-	-	-	1	2	1
CO4	1	2	2	1	3	-	-	-	-	-	-	-	2	2	1
CO5	2	2	3	2	-	-	-	-	-	-	-	-	2	1	2
CO6	-	2	-	-	-	-	-	-	-	-	-	-	3	2	2

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Digital Image Processing
Course Code	CSE0613[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)** **CO6-** To prepare a scenario to observe the performance evaluation of blockchain in comparison to contemporary technologies and to observe the potential application areas**(BL6-Create)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	1	2	-	-	-	2	-	-	2	2	1
CO2	1	-	-	-	1	2	-	-	-	-	-	-	2	2	3
CO3	2	2	-	2	-	-	-	-	-	-	-	-	1	-	2
CO4	1	2	-	1	-	-	-	-	-	-	-	-	1	2	2
CO5	1	2	-	1	-	-	-	-	-	-	-	-	1	-	2
CO6	1	2	-	3	1	3	-	-	-	-	-	-	1	2	2

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	*NCC / **MOOC
Course Code	NCC-0606[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**	SDG3(Good health and well-being) SDG4(Quality education) SDG6(Clean water and sanitation)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Machine learning
Course Code	CSL0701[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)** **CO6-** To prepare a scenario to observe the performance evaluation of blockchain in comparison to contemporary technologies and to observe the potential application areas**(BL6-Create)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	1	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	1	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	2	1	1	2	2	-	-	-	-	2	-	-	2	2	3

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Organizational Behavior
Course Code	HUL0701[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO2	1	2	-	-	-	-	-	-	-	-	-	-	2	1	-
CO3	2	1	-	1	-	-	-	-	-	-	-	-	1	-	-
CO4	1	1	-	2	-	-	-	-	-	-	-	-	1	2	1
CO5	1	1	-	1	-	-	-	-	-	-	-	-	-	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Seminar III
Course Code	CSD0702[P]
Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**

Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Major Project – I
Course Code	CSD0703[P]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth) SDG9(Industry Innovation and Infrastructure)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Cyber Security Fundamentals and Cyber Law
Course Code	CSE0721[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2
CO2	1	-	-	3	2	2	-	2	-	-	-	-	2	3	2
CO3	1	2	-	3	2	2	3	2	-	1	-	-	3	3	2
CO4	-	2	-	2	1	-	-	-	-	-	-	-	1	-	3
CO5	-	2	1	-	-	-	-	-	-	-	-	-	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Augmented Reality
Course Code	CSE0726[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	1	-	-	3	-	-	-	-	-	-	-	2	2	1
CO2	2	1	2	1	-	-	-	-	-	-	-	-	3	2	3
CO3	2	-	2	2	3	-	-	-	-	-	-	-	2	2	3
CO4	1	2	3	3	-	-	-	-	-	-	-	-	2	2	3
CO5	-	2	1	-	2	-	-	-	-	-	-	-	3	3	2
CO6	-	3	-	-	-	-	-	-	-	-	-	-	3	2	3

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Bioinformatics
Course Code	CSE0728[T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	-	2	-	-	-	-	-	-	-	2	2	1
CO2	-	1	1	3	-	-	-	-	-	-	-	-	1	2	1
CO3	1	2	3	2	1	-	-	-	-	-	-	-	3	2	1
CO4	2	1	1	1	-	-	-	-	-	-	-	-	2	3	2
CO5	1	2	1	-	1	-	-	-	-	-	-	-	3	3	-
CO6	-	2	-	-	1	-	-	-	-	-	-	-	1	3	1

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Deep Learning
Course Code	CSE0711 [T]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**		
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	-	2	-	-	1	2	3
CO2	3	1	-	2	2	2	-	-	-	2	-	-	1	2	3
CO3	2	2	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO5	1	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Advance web Technology
Course Code	CSE0712[T]
Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**

Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG4(Quality education)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	3	2	-	-	-	-	-	-	-	1	-	1
CO2	-	1	1	1	3	-	-	-	-	-	-	-	2	-	3
CO3	2	1	-	1	1	-	-	-	-	-	-	-	3	2	3
CO4	1	2	1	1	1	-	-	-	-	-	-	-	2	3	3
CO5	-	1	-	-	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Full Stack Development
Course Code	CSE0713[T]
Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**

Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG8(Decent work and economic growth) SDG12(Responsible consuption and production)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	3	2	-	-	-	-	-	-	-	1	-	1
CO2	-	1	1	1	3	-	-	-	-	-	-	-	2	-	3
CO3	2	1	-	1	1	-	-	-	-	-	-	-	3	2	3
CO4	1	2	1	1	1	-	-	-	-	-	-	-	2	3	3
CO5	-	1	-	-	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Software Project Management
Course Code	CSL0801[T]
Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**
Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕
SDG (Goals)	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CO2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
CO3	1	-	-	-	-	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	-	-	-	-	-	-	-	-	3	2	3
CO5	2	2	-	1	-	-	-	-	-	-	-	-	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Major Project - II
Course Code	CSD0804[P]
Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)** **CO5-** To evaluate the performance characteristics of blockchain in comparisontoavailabletechnologiesandwhatfeaturesofblockchainmakeitsoeffective.**(BL5-Evaluate)**

Course Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	1	-	-	-	-	-	-	-	2	2	2
CO2	1	-	2	-	2	-	-	-	-	-	-	-	1	2	1
CO3	1	2	-	2	1	-	-	-	-	-	-	-	2	2	1
CO4	1	1	-	2	-	-	-	-	1	-	-	-	2	2	1
CO5	-	-	-	-	1	-	-	-	-	1	-	-	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Course mapping with relevance to the local, regional, national, and global developmental needs

Title of the Course	Seminar
Course Code	CSL0802[P]

Course Outcomes & Bloom's Level	**CO1-** To remember Cryptography Techniques, Data Structures and Algorithms**(BL1-Remember)** **CO2-** To understand the concept and working of blockchain technology, various application areas like cryptocurrency, digital ledger etc. And role of cryptography in blockchain.**(BL2-Understand)** **CO3-** To implement the cryptography and mining to implement blockchain ledger and to implement security.**(BL3-Apply)** **CO4-** To analyze the role of miner sin blockchain. Application of blockchain in multiple areasandhowitprovidessuchaneffectivesecuremechanismofhandlingandmaintainingdataorrecords**(BL4-Analyze)**		
Course Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth)

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	1	-	-	-	-	-	2	-	3	-	-	-
CO2	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-
CO3	-	-	-	2	-	-	-	-	-	2	-	2	-	-	-
CO4	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-