S.E. Semester – IV

S.E. Semester –IV
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)							S.E.(SEM : IV)			
Course Name : Applied Mathematics IV							**Course Code : BSC-IT 401**			
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**				
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**				
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**		**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	-	**TW**		
3	1	-	4	4	25	75	-	25		**125**
IA: In-Semester Assessment- Paper Duration – 1.5 Hours										
ESE : End Semester Examination- Paper Duration - 3 Hours Total weightage of marks for continuous evaluation **of Term work/Report:** Formative (40%), Timely Completion of Tutorial (40%) and Attendance/Learning Attitude (20%).										
Prerequisite: Basic Mathematics.										

Course Objective: The course intends to deliver the fundamentals of basic probability and discrete probability distribution and apply the concept of continuous probability distribution, logic, sampling, Correlation, Regression and algebraic structure to different applications.

Course Outcomes: **Upon completion of the course student will be able to:**

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Apply the basic probability and discrete probability distribution concepts in various problem solving.	L1, L2
2	Apply continuous probability distribution concepts in technical problem	L1, L2, L3
3	Apply logic concepts in various applications.	L1, L2, L3
4	Apply concepts of sampling to draw statistical inference.	L1, L2, L3
5	Apply Correlation and Regression in data analysis.	L1, L2, L3
6	Apply algebraic structure concepts to different applications.	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic Probability** Discrete random variables, Independent random variables, Expectation of Discrete Random Variables, Moments, Variance of a sum, Binomial and Poisson distribution.	7	L1, L2
2	**Continuous Probability Distributions** Continuous random varibales and their properties, distribution functions and densities, normal, exponential and gamma densities.	7	L1, L2, L3
3	**Propositional Logic** Syntax and semantics, proof systems, satisfiability, validity, soundness, completeness, deduction theorem, etc. Decision problems of propositional logic. Introduction to first order logic and first order theory.	7	L1, L2, L3
4	**Large and Small sample** Test of significance: Large sample test for single mean, difference of means, Small sample Test for single mean, difference of means.	7	L1, L2, L3
5	**Applied Statistics** Chi-square test for goodness of fit and independence of attributes, Correlation coefficients (Karl Pearson and Rank), Regression.	9	L1, L2, L3
6	**Algebraic Structures** Algebraic structures with one binary operation – semigroup, monoid and group. Cosets, Lagrange's theorem, normal subgroup, homomorphic subgroup. Error correcting code. Algebraic structures with two binary operations- ring, integral domain, and field.	8	L1, L2, L3
Total Hrs.		45	

Books and References:

S.No.	Title	Authors	Publisher	Edition	Year
1	Introduction to Probability Theory	P. G. Hoel, S. C. Port and C. J. Stone	Universal Book Stall	-	2003
2	Advanced Engineering Mathematics	Erwin kreyszig	John Wiley & Sons	9th Edition	2006
3	A First Course in Probability	S. Ross	Pearson Education India	6th Edition	2002
4	An Introduction to Probability Theory and its Applications Vol. 1	W. Feller	Wiley	3rd Edition	1968
5	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	36th Edition	2010
6	A text book of Engineering Mathematics	N.P. Bali and Manish Goyal	Laxmi Publications	-	2008
7	Elements of Discrete Mathematics	C. L. Liu	Tata McGraw-Hill	2nd Edition	2000
8	Engineering Mathematics for first year	Veerarajan T	Tata McGraw-Hill, New Delhi	3rd Edition	2008
9	Discrete Mathematics with Applications to Computer Science	J. P. Tremblay and R. P. Manohar	Tata McGraw-Hill	-	1997

Online References:

S.No.	Website Name	URL	Modules Covered
1	www.nptel.ac.in	https://nptel.ac.in/courses/111106086/Lecture2.pdf	M1.M2.M3
2	www.cousera.org	https://www.coursera.org/	M4,M5,M6
3	www.wikipedia.org	https://www.wikipedia.org/	M1.M2.M3, M4,M5,M6

S.E. Semester –IV

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)							S.E(SEM : IV)		
Course Name : Principles of Communication							Course Code : ESC-IT 401		
Teaching Scheme (Program Specific)						Examination Scheme (Formative/ Summative)			
Modes of Teaching / Learning / Weightage						Modes of Continuous Assessment / Evaluation			
Hours Per Week					Theory (100)		Practical/Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW	
3	--	2	5	4	25	75	25	25	**125**
IA: In-Semester Assessment- Paper Duration – **1.5 Hours**									
ESE : End Semester Examination- Paper Duration - **3 Hours**									
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%).									
Prerequisite: Basics of Electrical Engineering									

Course Objective: The course intend to deliver the fundamentals of analog and digital communications, understand the concept of noise, and acquire the knowledge of amplitude modulation, frequency modulation. Also to apply and analyze concept of the Sampling theorem, Pulse Analog, Digital Modulation and Band pass modulation techniques, information theory and coding.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Objectives	Cognitive levels of attainment as per Bloom's Taxonomy
1	Differentiate analog and digital communication systems	L1, L2
2	Identify different types of noise and significance of noise in cascaded systems	L1, L2
3	Design of different AM transmitters and receivers.	L1, L2, L3, L4,L5,L6
4	Design various FM transmitters and receivers.	L1, L2, L3, L4,L5,L6
5	State sampling theorem and describe the concept of PAM, PWM, PPM, PCM, DM, ASK, FSK, PSK and representation of data in various line codes.	L1, L2, L3
6	Understand and apply entropy, source coding and channel capacity.	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
Module 1	**Introduction** Introduction of analog communication systems (Block diagram), Different types of Sources, Types of signals, Frequency / Spectrum allocations, Need for modulation.	04	L1, L2
Module 2	**Noise** Correlated and uncorrelated sources of noise in communication system, Noise parameters –Signal to noise ratio, Noise Factor, Noise Figure, Friis formula (Derivation and problems) and Equivalent noise Temperature.	05	L1, L2
Module 3	**Amplitude Modulation and Demodulation** Amplitude modulation techniques and its types- DSBFC AM, DSBSC-AM, SSB SC AM- spectrum, waveforms, bandwidth, Power calculations. AM Receivers – Block diagram of TRF receivers and Super heterodyne receiver. Receiver characteristics - Sensitivity, Selectivity, Fidelity, Image frequency and its rejection and double spotting.	09	L1, L2, L3,L4 L5,L6
Module 4	**Frequency Modulation and Demodulation** Principle of FM- waveforms, Spectrum, bandwidth. Pre- emphasis and de-emphasis in FM, FM noise triangle, Comparison of AM and FM systems, FM generation: Direct method –Varactor diode Modulator, Indirect method (Armstrong method) block diagram and waveforms. FM demodulator: Foster Seely Discriminator, Ratio detector	09	L1, L2, L3, L4,L5,L6
Module 5	**Pulse Analog and Digital Modulation** Sampling theorem for low pass and band pass signals, Anti- aliasing filter, PAM, PWM and PPM generation and Degeneration. Introduction to digital communication (Block diagram), Quantization process, Pulse code modulation, Delta modulation, Adaptive delta modulation, Multiplexing Techniques-TDM,FDM Introduction to Line codes, representation of binary data in different line codes. Binary Amplitude Shift keying, Binary Frequency Shift keying, Binary Phase shift keying, Quadrature phase shift keying, Quadrature amplitude Modulation	09	L1, L2, L3
Module 6	**Introduction to Information Theory** Introduction. Entropy & Types of Entropy Source Coding Prefix Coding. Channel Capacity. Data Compression algorithms, Lossless and lossy compression, Hoffman Code Algorithm.	09	L1, L2, L3
Total Hrs.		**45**	

S.No.	Title	Authors	Publisher	Edition	Year
1	Electronic Communication Systems	George Kennedy, Bernard Davis, SRM Prasanna	Tata McGraw Hill	5th	2015.
2	Electronic Communications Systems	Wayne Tomasi	Pearson Publication	5th	2008
3	Introduction to Analog & Digital Communications	Simon Haykin, Michael Moher	Wiley India Pvt	2nd	2012.
4	Principles of Communication Systems	Herbert Taub, Donald L Schilling	Tata McGraw Hill	5th	2015
5	Information Theory, Coding and Cryptography	Ranjan Bose	Tata McGrawHill	2nd	2008

Books and References:

Online References:

S.No.	Website Name	URL	Modules Covered
1.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/6	M1
2.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/7	M2
3.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/15	M3
4.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/39	M4
5.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/40	M5
6.	https://nptel.ac.in	https://nptel.ac.in/courses/117102059/	M6

List of Practicals/ Experiments:

S.No.	Type of Experiment	Practical/Experiment topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Basic experiment	Demonstration of Amplitude modulation.	2	L1, L2, L3
2		Demonstration of Frequency modulation.	2	L1, L2, L3
3		Study of radio receiver.	2	L1, L2, L3
4	Design Experiment	Signal sampling and reconstruction.	2	L1, L2
5		PAM generation and detection	2	L1, L2, L3
6		PWM, PPM generation and detection.	2	L1, L2, L3
7		PCM coding and decoding.	2	L1, L2, L3
8		Delta modulation and demodulation	2	L1, L2, L3
9		Implementation of TDM/ FDM.	2	L1, L2, L3
10	Group Activity/ Case Study	Study of BASK, BFSK.	4	L1, L2, L3
11		Study of BPSK, QPSK.	4	L1, L2, L3
12		Study of Inter symbol Interference and Line coding.	4	L1, L2, L3
	Total Hrs.		30	

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Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)							S.E.(SEM : IV)		
Course Name : Computer Organization & Architecture							**Course Code : PCC-IT 401**		
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**	**Total**
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	OR	TW	
3	1	-	4	4	25	75	25	25	**150**
IA: In-Semester Assessment- Paper Duration – 1.5 Hours									
ESE : End Semester Examination- Paper Duration - 3 Hours									
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%)									
Prerequisite: Computer Basics, Digital Logic									

Course Objective: The course intends to deliver the fundamentals of organizational and architectural issues of a digital computer, apply and analyze processor performance, Instruction & Processor parallelism, various multiplication, division algorithms of digital computer, memory hierarchy and various components of computer.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Describe basic organization and the architecture of computer	L1, L2
2	Understand control unit operation	L1, L2
3	Understand the concept of parallelism	L1, L2
4	Demonstrate and apply computer arithmetic operations on integer and real numbers.	L1, L2, L3
5	Understand Categorize memory organization and explain the function of each element of a memory hierarchy.	L1, L2
6	Analyze, Identify and compare different methods for computer I/O mechanisms.	L1, L2, L3, L4

Detailed Syllabus:

S. No.	Module	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
0	Prerequisite	Basic combinational and sequential logic circuits, binary numbers and arithmetic, basic computer organizations	01	L1, L2
I	Overview of Computer Architecture & Organization	Introduction of Computer Organization and Evolution of Computers, Von Neumann model. Performance measure of Computer Architecture.	06	L1, L2
II	Processor Organization and Architecture	CPU Architecture, Register Organization, Instruction formats, basic instruction cycle. Overview of 80x86 families. Control Unit: Soft wired (Micro- programmed) and hardwired control unit.	06	L1, L2
III	Parallel & Pipeline Processing	Introduction to parallel processing concepts, Flynn's classifications, pipeline processing, instruction pipelining, pipeline stages, pipeline hazards.	05	L1, L2
IV	Data Representation and Arithmetic Algorithms	Number representation: Binary Data representation, two's complement representation and Floating-point representation. Multiplication: Unsigned & Signed multiplication-Add & Shift Method, Booth's algorithm. Division of integers: Restoring and non-restoring division, signed division, basics of floating pointer presentation IEEE754 floating point (Single &double precision) number representation. Floating point arithmetic: Addition, subtraction	10	L1, L2, L3,
V	Memory Organization	Introduction to Memory and Memory parameters. Classifications of primary and secondary memories. Types of RAM and ROM, Allocation policies, Memory hierarchy and characteristics. Cache memory: Cache Coherency, Interleaved memory.	09	L1, L2
VI	I/O Organization	Input/output systems, I/O modules and 8089 IO processor. Types of data transfer techniques: Programmed I/O, Interrupt driven I/O and DMA. Peripherals.	08	L1, L2,L3,L4
	Total Hrs.		45	

Books and References:

S. No	Title	Authors	Publisher	Edition	Year
1	Computer Organization	Carl Hamacher, Zvonko Vranesic and Safwat Zaky	Tata McGraw Hill	5th	2013
2	Computer Organization and Architecture: Designing for Performance	William Stallings	Pearson Publication	5th	2008
3	Computer Architecture and Organization: Design Principles and Applications	Dr. M.Usha,T.S. Srikanth	Wiley India Pvt	1st	2014
4	Computer Architecture and Organization	JohnP.Hayes	Tata McGraw Hill	3rd	2015
5	8086/8088 family: Design Programming and Interfacing	John Uffenbeck	Pearson Education	2nd	2007

Online References:

S. No.	Website Name	URL	Modules Covered
1.	https://www.geeksforgeeks.org	https://www.geeksforgeeks.org/computer-organization-von-neumann-architecture/	M1
2.	https://www.w3schools.com	https://www.tutorialspoint.com/data_structures_algorithms/index.htm	M2
3.	https://www.w3schools.com	https://www.tutorialspoint.com/data_structures_algorithms/index.htm	M3
4.	https://www.geeksforgeeks.org	https://www.geeksforgeeks.org/python-programming-language/	M4
5.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/python/	M5
6.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/python/	M6

List of Tutorials:

S. No.	Tutorial	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1.	Multiply two numbers using add & shift unsigned multiplication algorithm.	1	L1, L2, L3
2.	Multiply two numbers using booth multiplication algorithm	1	L1, L2, L3
3.	Divide two numbers using restoring division algorithm	2	L1, L2, L3
4.	Divide two numbers using non- restoring division algorithm	2	L1, L2, L3
5.	Solve number using single precision IEEE floating point representation format.	1	L1, L2, L3
6.	Solve number using double precision IEEE floating point representation format.	1	L1, L2, L3
7.	Solve problem using various page replacement algorithm	2	L1, L2, L3
8.	Solve problem using best fit, first fit and worst fit algorithm.	2	L1, L2, L3
9.	Solve problem on various memory mapping techniques.	2	L1, L2, L3

S.E. Semester –IV

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)							S.E(SEM : IV)		
Course Name : Computer Networks							**Course Code : PCC-IT 402**		
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**			
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**			
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**OR**	**TW**	
3	-	2	5	4	25	75	25	25	**150**
IA: In-Semester Assessment- Paper Duration – **1.5 Hours**									
ESE : End Semester Examination- Paper Duration - **3 Hours**									
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%)									
Prerequisite: Concept of Basic Communication and Network									

Course Objective: The course intends to deliver the fundamentals of computer networking and apply the knowledge of computer networks for analyzing various algorithms spread over various layers of OSI reference model.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Objectives	Cognitive levels of attainment as per Bloom's Taxonomy
1	Describe the functions of each layer in OSI and TCP/IP model.	L1, L2
2	Understand the types of transmission media with real time applications.	L1, L2, L3
3	Describe the functions of data link layer and explain the protocol	L1, L2, L3
4	Classify the routing protocols and analyze how to assign the IP addresses for the given network.	L1, L2, L3, L4
5	Describe and analyze the Session layer design issues and Transport layer services.	L1, L2, L3, L4
6	Explain and analyse the functions of Application layer and Presentation layer paradigms and Protocols.	L1, L2, L3,L4

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction** Network Criteria, Physical Structures and Network Types: LAN, WAN, Switching, protocol implementation issues - Quantitative performance metrics OSI Reference model, TCP/IP suite, Comparison of OSI and TCP/IP, Network devices. Network Applications.	4	L1, L2
2	**The Physical Layer** Data and Signals: Analog and Digital, Transmission Impairment, Data Rate Limits, Performance, Digital Transmission: Digital-to-Digital Conversion, Analog-to-Digital Conversion, Analog Transmission: Digital-to-Analog Conversion, Analog-to-Analog Conversion, Bandwidth Utilization: Multiplexing, Spread Spectrum, Transmission Media: Guided Media, Unguided Media: Wireless, PSTN, Mobile Telephone system.	7	L1, L2,L3
3	**The Data Dink Layer** Wired Networks; Introduction: Nodes and Links, Two Types of Links, Two Sublayers, Data Link Control: Error Detection and Correction, Framing, Flow and Error Control techniques, Sliding Window Protocols, Medium Access Protocols: Random Access, Controlled Access, Channelization, Link Layer Addressing, Wired LANS: Ethernet Protocol; IEEE Project 802, Standard Ethernet, Fast Ethernet (100 Mbps), Gigabit Ethernet,10-Gigabit Ethernet, Virtual LANs, Other Wired Networks: Point-to-Point Networks, SONET, Switched Network :ATM, connecting Devices: Repeaters or Hubs, Link-Layer Switches, Routers, Sliding Window Compression.	7	L1, L2, L3
4	**The Network Layer** Introduction: Network-Layer Services, Packet Switching, Network-Layer Performance, Network-Layer Congestion, Structure of A Router, Network Layer Protocols: IPv4 Datagram Format, IPv4 Addresses, Forwarding of IP Packets, ICMPv4,Unicast Routing: General Idea, Routing Algorithms, Unicast Routing Protocols, Multicast Routing : Introduction, Multicasting Basics, Intra domain Routing Protocols, Inter domain Routing Protocols, Next generation IP: Packet Format , IPv6 Addressing , Transition from IPv4 to IPv6, traffic shaping and policing ,Congestion control algorithms , Mobile IP: Addressing , Agents , Three Phases , Inefficiency in Mobile IP.	12	L1, L2, L3, L4
5	**The Transport Layer** Simple Protocols, Stop-and-Wait protocol, Go-Back-N protocol, Selective repeat protocol, Piggybacking. User Datagram Protocol: UDP Services, UDP Applications, Transmission Control Protocol: TCP Services, TCP Features, Segment, Segment, A TCP Connection, State Transition Diagram, Windows in TCP, TCP Flow Control, TCP Error Control, TCP Congestion Control, TCP Timers.	10	L1, L2, L3, L4
6	**Application layer** Introduction: Providing Services, Application layer Paradigms, Client-Server Paradigm: Application Programming Interface, Using Services of the Transport Layer, Standard Client Server applications: World Wide Web and HTTP, FTP, Electronic Mail, TELNET, Secure Shell (SSH), Domain Name System (DNS), Peer-to-Peer Paradigm: P2P Networks, distributed hash table, Chord, Pastry, Socket Interface Programming.	5	L1, L2, L3,L4
	Total Hrs.	45	

Books & References:

S. No.	Title	Authors	Publisher	Edition	Year
1	Data Communication & Networking	Behrouz A. Forouzan	Mc Graw Hill education.	5th Edition	2014
2	Computer Networks	Andrew S Tanenbaum	Pearson Education	5th Edition	2014
3	Computer Networking: A Top-Down Approach Featuring the Internet	James F. Kurose, K. W. Ross	Pearson Education	5th Edition	2014
4	Computer Networks: A Systems Approach	L. L. Peterson and B. S. Davie	Elsevier India	5th Edition	2012
5	Understanding communications and Networks	W. A. Shay	Cengage Learning	2nd Edition	2001
6	Introduction to Data Compression	Khalid Sayood, Morgan Kaufman	Elseiver	Third Edition	2011

Online References:

S. No.	Website Name	URL	Modules Covered
1	https://www.javatpoint.com https://beginnersbook.com	https://www.javatpoint.com/computer-network-features https://beginnersbook.com/2019/04/osi-model-in-computer-network/	M1
2	https://nptel.ac.in	https://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html	M2
3	https://www.cse.iitk.ac.in/	https://www.cse.iitk.ac.in/users/dheeraj/cs425/lec14.html	M3
4	https://www.cse.iitk.ac.in/	https://www.cse.iitk.ac.in/users/dheeraj/cs425/lec10.html	M4
5	https://www.cse.iitk.ac.in/	https://www.cse.iitk.ac.in/users/dheeraj/cs425/lec09.html	M5
6	https://www.cse.iitk.ac.in/	https://www.cse.iitk.ac.in/users/dheeraj/cs425/lec03.html	M6

List of Practicals/ Experiments:

S.No.	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Basic Experiments	Installation of Linux Operating System	2	L1, L2
2		Study of vi editor and its commands	2	L1, L2, L3

3	**Design Experiments**	Study & demonstration of basic networking commands.	2	L1, L2, L3
4		Installation of NS-2	2	L1, L2, L3
5		Programming in NS-2	2	L1, L2, L3, L4
6		Implementation of network topology	2	L1, L2, L3
7	**Advanced Experiments**	Study & Analysis of TCP/IP header using Wireshark.	2	L1, L2, L3
8		Study & Analysis of UDP or SSL Protocol using Wireshark	2	L1, L2, L3
9		Implement connection oriented client server programming using TCP/IP.	4	L1, L2, L3, L4
10		Implementation of connectionless client server using UDP.	4	L1, L2, L3, L4
11	**Mini/Minor Projects/ Seminar/ Case Studies**	Case study to design and configure college network.	6	L1, L2, L3, L4,L5
Total Hrs.			**30**	

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TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)							S.E.(SEM : IV)			
Course Name :Programming Skill II (Python)							**Course Code : PCC-IT 403**			
Teaching Scheme (Program Specific)						**Examination Scheme (Formative/ Summative)**				
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**				
Hours Per Week					**Theory (100)**		**Practical/Oral (25)**	**Term Work (25)**		**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**PR**	**TW**		
3	-	2	5	4	25	75	25	25		**150**
IA: In-Semester Assessment- Paper Duration – 1.5 Hours										
ESE : End Semester Examination- Paper Duration - 3 Hours										
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/ Learning Attitude (20%)										
Prerequisite: Computer Basics, Procedural Programming Languages										

Course Objective: The course intends to deliver the fundamentals of Python programming, control statements and Functions, apply object Oriented Programming concept using Python, Errors and Exceptions, Files Handling and Analyze to Implement GUI application using Database.

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

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python	L1, L2
2	Apply different Decision Making statements and Functions	L1, L2,L3
3	Interpret and apply Object oriented programming concept	L1, L2, L3
4	Understand and Apply need based exceptions in the application	L1, L2, L3
5	Understand and summarize different File handling operations	L1, L2, L3
6	Construct GUI Applications in Python and evaluate different database	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basics of Python**	6	L1, L2
	Theory: Numbers in Python, Basic & Built-in Math functions, Number Formats, Strings, Quotes, print() Function, Assigning Values to Names & Changing Data Through Names, Copying Data, Tuples — Unchanging Sequences of Data, Lists — Changeable Sequences of Data, Dictionaries — Groupings of Data Indexed by Name, Special String Substitution Using Dictionaries , Arrays, Treating a String Like a List, Special Types, Ranges of Sequences, Working with Sets, Arrays		
2	**Decision Making and Functions**	6	L1, L2, L3
	Theory: If statement, if-elif-else, Repetition using while loop, for loop, break statement, Handling Errors- try: statement, except: statement, Functions- Grouping Code under a Name, defining a Function, describing a function in the function, Checking & Setting Your Parameters, Calling Functions from within Other Functions, Functions Inside of Functions, Layers of Functions		
3	**OOP's Using Python**	6	L1, L2, L3
	Theory: Creating a Class, Self-Variables, Constructors, Types of Methods, Inner Classes, Constructors in Inheritance, Polymorphism,, The super() Method, Method Resolution Order (MRO), Operator Overloading, Method Overloading & Overriding, Interfaces in Python.		
4	**Exception Handling and Packages**	10	L1, L2, L3
	Exceptions Handling: Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions, The Except Block, The assert Statement. Modules and Packages: Creating Modules and Packages, Documenting & Viewing Module, Basics of Testing Your Modules and Packages, Importing & exporting Modules		
5	**Files Handling**	8	L1, L2, L3
	Theory: Types of Files in Python, Opening a File, Closing a File. Writing Text Files, Knowing Whether a File Exists or Not, Working with Binary Files, Appending Text to a File, Reading Text Files, File Exceptions, The with Statement Pickle in Python, Lambda and Filter, Map & range functions		
6	**GUI Programming and Databases**	9	L1, L2, L3
	Theory: GUI Programming - Writing a GUI with Python: GUI Programming Toolkits, Creating GUI Widgets with Tkinter, Creating Layouts, Radio Buttons and Checkboxes, Dialog Boxes. Database Access - Python's Database Connectivity, Types of Databases Used with Python, Mysql database Connectivity with Python, Performing Insert, Deleting & Update operations on database		
	Total Hrs.	45	

Books & References:

S. No	Title	Authors	Publisher	Edition	Year
1	Beginning Python: Using Python 2.6 and Python 3.1	James Payne	Wrox Publication	2nd	2010
2	Core Python Programming	Dr. R. Nageswara Rao	Dreamtech Press, Wiley Publication	2nd	2010
3	Beginning Python From Novice to Professional	Magnus Lie Hetland	Apress Publication	2nd	2012.
4	Core Python Applications Programming	Wesley J Chun	Pearson Publication	3rd.	2015
5	Introduction to Computing and Problem Solving using Python	E. Balguruswamy	McGraw Hill Publication	2nd	2014

Online References:

S. No.	Website Name	URL	Modules Covered
1.	https://www.w3schools.com	https://www.w3schools.com/python/	M1
2.	https://www.w3schools.com	https://www.tutorialspoint.com/data_structures_algorithms/index.htm	M2
3.	https://www.w3schools.com	https://www.tutorialspoint.com/data_structures_algorithms/index.htm	M3
4.	https://www.geeksforgeeks.org	https://www.geeksforgeeks.org/python-programming-language/	M4
5.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/python/	M5
6.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/python/	M6

List of Practicals/ Experiments:

S. No.	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Basic Experiments	Problems on Basics of Python	2	L1, L2
2		Problems on Decision Making and Functions	2	L1, L2
3	Design Experiments	Problems on OOP's using Python programming (Abstraction, Encapsulation)	2	L1, L2, L3
4		Problems on OOP's using Python programming (Inheritance and Polymorphism)	2	L1, L2, L3
5		Problems on Exception Handling(Inbuilt Exceptions)	2	L1, L2, L3
6		Problems on Exception Handling (User defined Exceptions)	2	L1, L2, L3
7		Problems on Packages	2	L1, L2, L3
8		Problems on Files Handling	2	L1, L2, L3
9	Advanced Experiments	GUI Programming using python-1	2	L1, L2, L3
10		GUI Programming using python -2	2	L1, L2, L3
11		Databases Connectivity using python	2	L1, L2, L3, L4
12		GUI with Databases connectivity using python	2	L1, L2, L3, L4
13	Mini/Minor Projects/ Seminar/ Case Studies	Employee Payment Management System in Python, . Restaurant Management system in Python, Courier Management system in Python https://www.kashipara.com/project/category/download_python-project-source-code_12 (For more Project Ideas)	6	L1, L2, L3, L4,L5,L6
	Total Hrs.		**30**	

S.E. Semester –IV
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

BE (Information Technology)								S.E. (SEM : IV)		
Course Name : Value Education								Course Code : MC IT 401		
Teaching Scheme (Program Specific)						Examination Scheme (Formative/ Summative)				
Modes of Teaching / Learning / Weightage						Modes of Continuous Assessment / Evaluation				
Hours Per Week						Theory (100)		Presentation (25)	Report (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	AC	AC	
1	--	--	1	Non credit	--	--	--	25	**25**
AC- Activity Evaluation										
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/ Learning Attitude (20%)										
Prerequisite: Moral Science										

Course Objective: The course intends to deliver the fundamentals of the concept of Ethics in Engineering & Human values, significance of values in Self-development, ethical human value and apply values needed for peaceful society, aware value education, towards personal, national and global development.

Course Outcomes: Upon completion of the course student will be able to:

S.No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Develop commitment to professional ethics, responsibilities and norms of the engineering practice.	L1, L2
2	Develop a good moral character and social attitude.	L1, L2
3	Determine the proper use of engineering knowledge to bring uplift in quality of life, along with peace and conflict resolution.	L1, L2, L3
4	Propagate ethics and values in society.	L1, L2, L3
5	Apply values such as care and compassion; honesty and trustworthiness;	L1, L2, L3
6	Global development through integrity; respect; responsibility and understanding, tolerance and inclusion.	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Value Education - Introduction**		L1, L2
	Understanding the importance of Value Education, Need in modern Society, Benefits for students, Adding Value to Life, Self-Exploration as the Process for Value Education.	2	
2	**Values and Ethics**		L1, L2
	Definition, Concept, Classification, value based life, Present day materialistic approach, importance of value in human lives, Humility, Attitude, self-confidence, Theory, Criteria and Sources of values. Ethics, Role of Ethics, Educational Ethics, imparting ethics in educational age, integrating spiritualty with education.	2	
3	**Right Understanding**		L1, L2, L3
	Providing the Basis for Universal Human values and Ethical Human Conduct, Basis for the Holistic Alternative Unit Universal Human Order, Professional Ethics in the Light of Right Understanding, Vision for Holistic Technologies, and Journey towards the Holistic Alternative- The Road Ahead.	3	
4	**Dealing with Habits**		L1, L2, L3
	Introduction to Habits- Simple , Serious and Grave bad Habits, Cause of Addiction to bad habits, How some bad habit are bad though they feel good, what implies one to go on with bad habits, How to have right perception ,The Power of Good habits, importance of right association.	3	
5	**Dealing with Stress**		L1, L2, L3
	About Stress, definition and causes, Positive stress, Negative Stress, Statistics of Stress, and Suicides the present day Stupid idea. How to deal with cries in our life, Art of Tolerance, Making Right Choice, Life Style Management.	3	
6	**Harmony at Various Levels**		L1, L2,L3
	Understanding the Human Being as co-existence of self and body Harmony in Self, Harmony with the body, Harmony in the Family, Harmony in the Society, Harmony in Nature, Harmony in Existence.	2	
	Total Hrs.	**15**	

Books and References:

S.No.	Title	Authors	Publisher	Edition	Year
1.	Value Education for Young Leaders	Dr. P Hari Krishna	Vashnavi Krishna Publication	2nd Edition	2015
2.	Value education	Singh Y K	APH Publishing Corporation	2nd Edition	2009
3.	Professional Ethics	R. Subramanian	Oxford Publication	4th Edition	2017
4.	Beyond Illusion and Doubt	A. C Bhaktivedanta Swami	BBT	5th Edition	2017
5.	Open eye Meditation	Shubha Vilas Das	FinGer Print Belief	2nd Edition	2016
6.	Life Amazing Secrets	Gaur Gopal Das	Penguin India	1st Edition	2018
7.	Ethics from Epics	Govinda Das	Tulsi Publication	1st Edition	2015
8.	Peace and Value Education	Kiruba Charles & V. Arul Selvi	Neelkamal Publications	1st Edition	2016
9.	A Hand Book on PANCH KOSH	Rajesh A Kadam	Shishmahal Arts Co	1st Edition	2019

Online References:

S. No.	Website Name	URL	Modules Covered
1	http://www.yourarticlelibrary.com	http://www.yourarticlelibrary.com/education/values-education/value-education-meaning-objectives-and-needs-india/86967	M1,M2
2	https://ed100.org	https://ed100.org/lessons/valueshabits	M4
3	http://www.indiancurrents.org	http://www.indiancurrents.org/article-new-education-policy-stress-on-value-education-in-schools-103.php	M5

S.E. Semester –IV
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)									S.E. (SEM : IV)		
Course Name : Professional Skill IV(Data Pre-processing for Machine Learning)									**Course Code :** HSD-ITPS401		
Teaching scheme (Holistic Student Development - HSD) (Conducted in the beginning of Semester during first 3 Weeks)						**Examination Scheme (Formative/ Summative)**					
Modes of Teaching / Learning / Weightage						**Modes of Continuous Assessment / Evaluation**					
Hours					**Theory (100)**		**Presentation (50)**		**Report (25)**		**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**AC**		**AC**		
15	-	30	45	2	--	--	50		25		**75**
AC- Activity Evaluation **Total weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%).											
Prerequisite: Database and Programming Language											

Course Objective: The course intends to deliver the advance pyhon concept to create easy-to-use and easy-to-maintain modules and packages. This Course will help to manipulate data, build custom classes and functions, create lists, and write more elegant, optimized code.

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

S.No.	Course Objectives	Cognitive levels of attainment as per Bloom's Taxonomy
1	Study numpy and associated functions	L1, L2
2	Implement data Types , Advance Python Numbers, Advance Python Strings	L1, L2
3	Implement Decorators, Generators , Iterators and Collections	L1, L2, L3
4	Solve various problems using data structures	L1, L2, L3
5	Handle the files using various methods	L1, L2, L3
6	Develop the understanding to manipulate the dataset using different technique.	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
01	**Introduction** Data Types, Variables, Basic Input-Output Operations, Basic Operators, Boolean Values	02	L1, L2, L3
02	**Control statements and functions** Conditional Execution, Loops, Lists and List Processing, Logical and Bitwise Operations, Functions	02	L1, L2, L3,L4
03	**Introduction to Python Libraries** NumPy , Scipy , Scikit-learn, Pandas, Matplotlib	02	L1, L2, L3
04	**Python Objects and Data structures** Python Numbers, Python Strings, Python Sets, Python Dictionaries and Advance List.	03	L1, L2, L3,L4
05	**Working with Data Processing Part- I** Reading and Writing Text Files, Microsoft Excel files with Python	03	L1, L2, L3,L4
06	**Working with Data Processing Part- II** Get Dataset, Importing Libraries, Importing Data Set ,Missing Data, Categorization Data, Splitting Datasets Into Training Sets And Test Set, Features Scaling	03	L1, L2, L3,L4
	Total Hrs.	**15**	

Books and References:

Sr. No	Title	Authors	Publisher	Edition	Year
1	The Complete reference Python	Martin Brown	McGraw- Hill	Second	2018
2	Advanced Python Programming	Dr. Gabriele Lanaro, Quan Nguyen	Packt Publishing	First	2019

Online References:

S. No.	Website Name	URL	Modules Covered
1	https://realpython.com	https://realpython.com/tutorials/advanced/	M1-M6
2	https://www.techbeamers.com	https://www.techbeamers.com/python-tutorial-step-by-step/	M1,M3, M6

List of Practicals/ Experiments:

S.No.	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic Experiments**	Code on Numpy Library with associated functions.	2	L1, L2, L3
2		Code on Control statements	2	L1, L2, L3
3	**Design Experiments**	Code on Python Data Types , Advance Python Numbers	4	L1, L2, L3
4		Code on Advance Python Strings	4	L1, L2, L3
5		Code on Decorators, Generators , Iterators and Collections	4	L1, L2, L3
6	**Advanced Experiments**	Code on Python Dictionaries	2	L1, L2, L3
7		Code on Reading and Writing Text Files, Microsoft Excel files with Python	2	L1, L2, L3
8		Code for handling Missing Data, Categorization Data, Splitting Datasets into Training Sets and Test Set, Features Scaling	4	L1, L2, L3
9	**Mini/Minor Projects/ Seminar/ Case Studies**	Design a Mini Project	6	L1, L2, L3 ,L4,L5
		Total Hrs.	30	

S.E. Semester –IV

Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E (Information Technology)								S.E(SEM : IV)		
Course Name : Project Based Learning-II								**Course Code:** HSD-**ITPBL401**		
Teaching scheme (Holistic Student Development - HSD) (Conducted in the beginning of Semester during first 3 Weeks)					**Examination Scheme (Formative/ Summative)**					
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**					
Hours					**Theory (100)**		**Presentation (25)**	**Report (25)**		**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**	**ESE**	**AC**	**AC**		
-	-	30	30	1	-	-	25	-		**25**
AC- Activity Evaluation **The weightage of marks for continuous evaluation of Term work/Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite: Computer Fundamentals & knowledge of Programming Languages										

Course Objectives: The course intends to deliver the fundamental knowledge of basic real time problems, study existing solutions, prepare literature survey, and apply basic computing & mathematics fundamentals and fundamental concepts of Programming such as C/C++ and Java to solve Basic real time problems.

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

S. No.	Course outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	To identify & analyze the basic real time problems and prepare literature survey.	L1, L2, L3,L4
2	Identify & apply appropriate technologies & programming constructs to solve problems.	L1, L2, L3
3	Presenting & Documenting results obtained.	L1, L2, L3,L4

Suggested Project Topics:

Sr. No.	Project Titles for PBL
1	Multiple contingency services application
2	GST calculating website
3	Book Benchers website
4	Prediction of lifestyle disease
5	Automated Canteen web application
6	Healthcare Application
7	E-Ticketting App
8	Food Donation App
9	Human Safety Application
10	Medical help website
11	Job Finder Application
12	Book review website
13	Traffic and Accident Management
14	Medical Emergency App
15	Platform that Lists All Startup Related Events
16	Citizen Feedback on Maintenance of Road
17	Group messaging solution
18	Online personal diary
19	Drive mode app for road safety
20	Paperless office
21	Accident prevention.
22	Android app for university helpline,
23	Community based Web application
24	Virtual Assistant
25	Student Monitoring System
26	Personal management assitant
27	Common mobility application
28	Mobile app for Sansad adarsh gram yojna
29	To design dynamic website using advanced web technologies
30	Sustainable tourism management
31	Efficient, easy and integrated billing system
32	Identifying accident prone area for roads
33	Yoga helathcare management system
34	IOT in agriculture
35	Games on Road Safety
36	App development using IOT
37	Indian Railways on Google Earth
38	Google Ad Grants online marketing challenge

Note: Project topic can be selected as per the Domain and current Trends in the Technology.

S.E. Semester –IV
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E. (Information Technology)						S.E. (SEM : IV)		
Course Name :Activity Based Learning IV						**Course Code:HSD-ITABL401**		
Teaching scheme (Holistic Student Development - HSD) (Conducted in the beginning of Semester during first 3 Weeks)						**Examination Scheme (Formative/ Summative)**		
Modes of Teaching / Learning /Weightage						**Modes of Continuous Assessment / Evaluation**		
Hours						**Presentation**	**Report**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**		**AC**	**AC**	
-	-	30	30	1		25	25	50
AC- Activity Evaluation								
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)								
Prerequisite: Basics of Computer Programming, General knowledge, Social awareness,								

Course Objectives: The larger objective of the course is to develop the Society Sensitive Citizens by creating awareness among students and take up the initiatives in the Activity mode for the needy.
The course intends to deliver the understanding of the concepts of critical thinking, encourage the students to look beyond their textual knowledge, establish the relationship between theory and the applications of the learned concepts. It also intends to address the social issues and help the society in the area of work.

Course Outcomes:

S.No.	Course Outcome	Cognitive level attainment as per revised Bloom Taxonomy
1	Student will be able to outline the procedures for Creative writing, which will give them wings of imagination with self-expression in the topic. Learn on multidisciplinary subjects.	L1, L2, L3
2	Student will know the importance of the *extempore* speech which will help them to think and develop presence of mind. Exposure to Group discussion will provide an opportunity to all team members to give their ideas and opinion on a certain topic. It increases one's listening skills and confidence in speaking. Team building improves.	L1, L2, L3
3	Students will learn the strengths of survey research including its effectiveness, generalizability, reliability, and versatility. Students will be able to make the awareness about various social issues.	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs	Cognitive level attainment as per revised Bloom Taxonomy
1	**Creative writing (technical/non-technical**		L1, L2, L3
	I. Introduction to creative writing. a) Orientation and Introduction to Writing skills both article form and paper writing. Information about the rules and regulations about original writing. Templates of good journals eg. (IEEE format) with emphasize on originality, plagiarism check. Topic distribution in different categories as per choice of students Select the topic of article/ paper either from choice or in consultation with teacher. Discussion forum or Use of internet is allowed for the same. **Brainstorming and prewriting** Form teams divide into 8 teams. 5 students per team. Form the skeleton of the paper with data properly designed. check the plagiarism and shaping the article/paper with the team.	2	
	II. Drafting and editing Continuation of the article/paper shaping, taking care of plagiarism Submit the article /paper introduction in one page outlining the salient features of the topic in hard copy. Students can have the freedom of choosing mentor faculty from college if needed. Finalizing the article/ paper. **Demonstration by students** and evaluation (Presentation of papers of 4 teams with inputs from mentors/teachers) **Evaluation by faculty as per format.**	2	
2	**Lecturette (Extempore speech)**		L1, L2, L3
	I. Introduction Orientation and Introduction to lecturette/ extempore rules The candidate is required to deliver a short talk for 03 minutes to the group watching him. Choice of topic discussion. Technical/ Non-technical **A suitable topic** is to be chosen out of 04 topics given. 03 minutes will be given for thinking, jotting down points and organizing the speech without any help. Candidate has to introduce himself/herself in brief before starting the talk.	2	
	II. Extempore/Presentation by each student **Evaluation by faculty as per format.**	2	
3	**Group Discussion**		L1, L2, L3
	I. Introduction and orientation about Group discussion and rules . GDs form an important part of the short-listing process for recruitment or admission in a company or institution. Types of GD Topics such as social, political, economic, technical etc. Topic choice to be given to students and based on that Team formation on the chosen topic Brainstorming among the students to form teams on topics selected. **.Prepare the points for group discussion.** Formation of four teams for two topics. Two teams (For and against) for topic I will debate first and the other two team will be audience and for topic II vice-versa.	2	
	II. Paraphrasing/summarizing. Evaluation will be based on Creativity skills supported by listening and participating proactively by presentation of teams. Group discussion among the teams members sequentially, other teams will be audience to discussing team and vice versa.	2	

	Evaluation by faculty as per format		
4	**SURVEY DESIGNING AND STUDY**		
	I. Introduction and Orientation to research methodology emphasizing on survey designing. Surveys can be administered in many modes, including: online surveys, email surveys, social media surveys, paper surveys, mobile surveys, telephone surveys, and face-to-face interview surveys. Brainstorming and establishing the goal of the project Form teams, divide into 8 teams. 5 students per team. Select the topic of survey topic with feasible insight either from choice or in consultation with teacher. Discussion forum or Use of internet is allowed for the same. **Structuring and Designing the Questionnaire** Create the sample questionnaires(max 10) mapping with goal established Interview the peer team members for data (all students should be asked.) Field survey topics can also be collected.	2	
	II. Collection of the data and use the tools for analyses of the survey incorporated if any. Finalizing the results Data analyses in the form of written article and graphs projection for the same. Presentation of survey results by teams (a)Demonstration by students 4 teams b) Presentation of another 4 teams Submission of projects as hard copy Evaluation by faculties	2	
5	**Extended Work**		L1, L2, L3
	I Orientation and Introduction about social responsibilities. Team formation 5 students in each team. Visit to nearby community to provide necessary help based on the following topics **(a)Food Waste (TCET canteen) and societies.** Keep record of food waste daily in kilogram, help in designing the display of food wastage every day. Similarly extend the idea in their own society during festivals, gatherings.	4	
	(B) Health awareness Take the record of the societies in which they reside, collect the information about vaccinations (age wise , validity of time etc) Record maintenance	4	
	(c) 3-minute Film making or case study on the above two themes by teams and presentation. **Evaluation by faculty as per format.**	6	
	Total Hours	30	

Books and References:

1.Creative Writing Book,Book by Louie StowelL

2. Group Discussion on Current Topics,Book by By : Major (retd.) P. N. Joshi

3.Complete Guide to Group Discussion,Book by PRASOON. PROF SHRIKANT

4. Extempore speech, how to acquire and practice it,Book by William Pittenger

5. http://theconversation.com/awareness-of-food-waste-can-help-us-appreciate-holiday-meals-105798

6. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5072240/

S.E. Semester –IV
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS- H 2019)
TCET Autonomy Scheme (w.e.f. A.Y. 2020-21)

B.E. (Information Technology)						S.E. SEM: IV	
Course Name: Summer Internship						**Course Code: SI-IT401**	
Teaching scheme (during Week End / Semester Break/ End of Semester(Between 21st and 25th Week))					**Assessment/Evaluation Scheme**		
Hours					**Presentation**	**Report**	
Theory	**AC**	**Practical**	**Contact Hours**	**Credits**	**AC**	**AC**	**TW**
-	-	-	160-240*	4 *- 6*	-	-	50

AC- Activity evaluation TW – Term Work Examination
Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/Learning Attitude (20%).

Prerequisite: Fundamental knowledge of Information Technology related tools

* Students may go upto 240 hrs. to aquire maximum 6 credits. Students should collectively acquire total contact hrs in below given activities in a span of 1 year (3rd and 4 th Semester). Student will submit a report to earn Termwork marks in internship at the end of 4th Semester.

1) Participation in in-house internship at the end of 3rd and 4th semester of 2 week each.

2)Other Activity which also will be considered are: Participation in Hackathon, Development of new Product/ Business Plan / Registration of start-up, Participation in IPR workshop/Leadership talks/Idea/ Design / Innovation/Technical Expos, Internship with Industry / Govt. / NGO/ PSU/MSME/Online Internship, Long Term Goals under Rural Internship.

Course Objectives:

To get industry like exposure in the college laboratories by carrying out projects using subject studied till 6th semester. Also design innovative techniques / methods to develop the products.
To gain knowledge of marketing and publicizing products developed.

Course Outcomes: **Upon completion of the course students will be able to:**

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	To apply subjects knowledge in the college laboratories for carrying out projects	L1, L2,L3
2	Able to developed innovative techniques / methods to develop the products	L1, L2,L3
3	Able to do marketing and publicity of products developed	L1, L2,L3

Detailed Syllabus:

Module No.	Topics	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Program Specific Internship** Training and certification on emerging technologies in domains offered by Department of Computer Engineering Applying classroom and laboratory knowledge to design , develop and deploy the products	L1, L2, L3
2	**Inter disciplinary Internship** • To explore and understand issues and challenges in the other disciplines (EXTC, ELEX, MECH and CIVIL) • Design , develop and deploy cost effective products using multidisciplinary approach	L1, L2, L3
3	**Industry Specific Internship** • To explore and understand issues and challenges in industry • Developing solutions for industry specific problems • Design , develop and deploy products for startup and SMEs	L1, L2, L3
4	**Interpersonal Internship** • To develop interpersonal skills such as leadership, marketing ,publicity and corporate ethics and communication • To get competence in problem solving , presentation , negotiation skills	L1, L2, L3
5	**Social Internship** • Identify and study different real life issues in the society • Identify societal problems and provide engineering solutions to solve these problems	L1, L2, L3
6	**Academic Internship** • Study report preparation, preparation of presentations, copy table book preparation , business proposal and IPR • Capture aspirations & expectations through interviews of students. • Ways to connect research in technical institutes with industry. • Taking inputs from self, local stakeholders and global stake holders which will help to develop process with comparative and competitive study.	L1, L2, L3

Books and References:

Sr. No.	Title	Authors	Publisher	Edition	Year
1	The Ultimate Guide to Internships: 100 Steps to Get a Great Internship and Thrive in It (Ultimate Guides)	Eric Woodard	Allworth	I	2015

Online References:

Sr. No.	Website Name	URL	Modules Covered
1	https://www.letsintern.com/	https://www.letsintern.com/internships/summer-internships	M1-M6
2	https://codegnan.com	https://codegnan.com/blog/benefits-of-internships-and-importance	M1-M6
3	https://www.honorsociety.org	https://www.honorsociety.org/articles?category=internships	M1-M6