Program: B. Tech Computer Science (Data Science)				Semester: I	
Course/Module: Basics of Electrical and Electronics Engineering				Module Code: BTCDS1008	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: Knowledge of basic concepts of physics and mathematics

Objectives:

- To introduce the basic concepts of DC and AC circuits, transformers and motors.
- To understand the construction, working principle and simple applications of basic electronic devices.
- To provide knowledge of designing simple circuits used in computer systems using op-amp and timer IC.
- To provide knowledge of designing digital logic circuits using basic building blocks, to be used in computer hardware design.
- Get exposed to interdisciplinary engineering fields.

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

1. Understand the working and applications of transformers and motors in computer science engineering
2. Analyze the characteristics of diodes, BJTs and FETs and design simple circuits using them.
3. Design circuits for simple applications using IC 741 and IC 555.
4. Analyze and design combinational and sequential logic circuits.

Detailed Syllabus:

Unit	Description	Duration

1	Basic concepts and circuit analysis: DC circuits- current–voltage relationships, ideal and practical voltage and current sources; AC circuits- AC waveform definitions; Transformer- principle of operation, applications of transformers in computer engineering; DC motor, servo motor and Stepper motor- principle of working, construction, and examples of their use with computer controlled systems	5
2	Diodes and diode circuits: (no in-depth mathematical treatment) Forward and reverse biased P-N junction diode, Zener diode Applications of diode: Rectifier circuits- half wave and full wave with filters; Regulator circuit- design of Zener regulator;	3
3	Bipolar Junction Transistors: (no in-depth mathematical treatment) NPN and PNP transistor mechanism, CE, CB and CC configurations, transistor characteristics: cutoff, active and saturation modes, concept and need of transistor biasing, voltage divider biasing Design of transistor as a switch, and amplifier	3
4	Field Effect Transistors: (no in-depth mathematical treatment) Concept of FET (channel width modulation) N-channel and P-channel JFET structure and characteristics, MOSFET structure and characteristics, depletion and enhancement types, CMOS: basic principles and design of basic gates	3
5	Transistor Oscillators: (no in-depth mathematical treatment) RC phase shift, Hartley, Colpitt, Wien Bridge	2
6	IC 741 Operational Amplifier: Basics of op-amp, 741 op-amp; Op-amp applications: inverting and non-inverting amplifier, voltage follower,	6

	summer, subtractor, differentiator, integrator, voltage comparator, sample and hold circuit; design of 1st order high pass, low pass and band pass filter; design of Wien bridge and RC phase shift oscillator; design of fixed voltage regulator	
7	IC 555 Timer: IC 555 basics; design of astable, monostable and bistable multivibrators using IC 555.	2
8	Digital Electronics Fundamentals: Difference between analog and digital signals, Boolean algebra, basic and universal gates, symbols, truth tables, logic expressions, logic simplification using K-map, logic ICs Design of combinational and sequential circuits: half and full adder/subtractor, multiplexers, demultiplexers, encoders, decoders, flip-flops, shift registers, counters	6

Text Books:

1. Vincent Del Toro, "Electrical Engineering Fundamentals", Prentice Hall of India, 2nd edition, 2015.
2. R. L.Boylestad and L. Nasheksky, "Electronic Devices and Circuit Theory", Pearson, 11th edition,2014.

Reference Books:

1. Morris Mano, "Digital Design", Prentice Hall of India, 2008

Any other information:
Details of Internal Continuous Assessment (ICA)
Test Marks: 20
Term Work Marks: 30

Signature   **Signature**
(Prepared by Concerned Faculty/HOD)   **(Approved by Dean)**

SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management and Engineering

Program: B. Tech Computer Science (Data Science)		Semester: I	
Course/Module: Business Calculus		Module Code: BTCDS1002	

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	0	1	4	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: Knowledge of Fundamentals of Differential and Integral Calculus.

Objectives:
1. To provide sound understanding of the concepts in Calculus needed in Business and Economics.
2. To enable students to apply the concepts of Calculus to Business and Economics.

Outcomes: After successful completion of this course, students will be able to
1. Demonstrate understanding of functions, graphs, derivatives and mathematical modelling.
2. Solve problems based on derivatives, partial derivatives and integration.
3. Analyze and optimize functions.
4. Apply the techniques of calculus to business and economics.

Detailed Syllabus:

Unit	Description	Duration
1	Functions, Graphs and Limits Functions, The graph of a function, Linear functions, Mathematical modelling, limits of functions, limits involving infinity.	5
2	Differentiation and Applications of derivatives Rate of Change, Marginal analysis and approximations using increments, Implicit differentiation and related rates, Increasing and decreasing functions, relative extrema,	10

	concavity and points of inflection, Optimization, Elasticity of demand, Applications of optimization.	
3	Exponential and Logarithmic Functions Exponential functions; Continuous compounding, Differentiation of exponential and logarithmic functions, Applications; exponential models, optimization.	6
4	Integration and Applications of Integrals The definite integral, Average value of the function, Applications of Integration to Business and economics.	5
5	Calculus of Several Variables Functions of several variables, Partial derivatives, Optimizing functions of several variables, Constrained optimization: The method of Lagrange multipliers, The method of least-squares, Double integrals, Applications to Business and economics.	12
6	Differential Equations First order and Second order ordinary differential equations and their economic applications.	7

Text Books:
1.*Edward T.Dowling,* ' Introduction to Mathematical Economics' , *McGraw-Hill, 3rd Edition,* 2011.
2.*Thomas*, 'Calculus' , *Pearson Education, 7th edition*, 2014.

Reference Books:
1.*Laurence D. Hoffmann, Gerald L. Bradley,* 'Calculus for Business, Economics, and the Social and Life Sciences', *McGraw-Hill, 10th Edition,* 2010.
2.*Marvin L.Bittinger,* ' Calculus and its Applications' , *Pearson, 9th Edition,* 2007.
3.*Raymond A. Barnett, Michael R. Ziegler, Karl E.Byleen, Christopher J. Stocker,* ' Calculus for Business, Economics, Life Sciences and Social Sciences' , *Pearson, 14th Edition,* 2019.

Any other information:
Details of Internal Continuous Assessment (ICA)
Test Marks: 20
Term Work Marks: 30

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(Prepared by Concerned Faculty/HOD)   **(Approved by Dean)**

Program: B. Tech. Computer Science (Data Science)				Semester: I	
Course/Module: Communication Skills-I				Module Code: BTCDS1004	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	0	0	3	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: Nil

Objectives:

- To develop an understanding of insight into communication process and different styles
- To develop skills of integrating technology appropriately as well as an understanding of formal communication situations.
- To develop an ability of active listening and critically analyzing the content that the students are exposed to.
- To develop the skill to draft, design and format written documents and other non-formal write ups, applying the language and communication principles.

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

1. Draft, design and format formal Written documents correctly and effectively
2. Conduct audience analyses and use that knowledge for effective oral and written Communication
3. Present with a difference and with need based, technology mediated and customized presentations.
4. Evaluate problem contexts to Create impactful solutions through positive communication approaches used as intervention tactics.

Detailed Syllabus:

Unit	Description	Duration
1	**Communication Basics**: Communication cycle and possible breakdowns in communication; Communication in organizational settings, hierarchy, networks and modes of communication, oral and written communication-basics, advantages and disadvantages; non-verbal cues in communication. Understanding Unique Communication Approaches and individual communication styles; Assertive communication Techniques. Importance of Audience analysis for effective communication. Minimizing Distractions- Understanding and removing barriers from communication.	8
2	**Written Communication:** Fundamentals of Sound Writing- Introduction to writing Process; purpose of writing; Clarity in writing; principles of writing; Grammatical Errors and proofreading.- Followed up with Practice Exercises. Writing techniques and electronic writing process. Non-verbal cues in written communication-tonality of message, levels of formality etc.; attitude expressed through written message; audience analyses to customize written messages. Stylistic elements in writing; format-oriented writing; Emails, letters, formal proposals and Requests for Proposals; agenda and minutes of meeting etc. Portfolio Exercise- Proposal writing; Letters; blogs; micro blogs; feature articles and Creative writing. Document makeovers (Includes all relevant Kinds of Business Letters ; memos; Proposals; RFPS; email messages etc.)	12

| 3 | **Oral Communication:**

 First Meetings and Introductions- Etiquette governing Introduction, Greetings, card Exchange and small talk. Situational conversations – simulation exercises creating artificial situations demanding conversational skills Informal and Formal conversations- Some do's and don'ts governing formal and informal communicative situations. Effective Oral and Online Presentations; PPT Presentations; Individual and Team Presentations; Visuals in Presentations-Developing and Designing effective Visual Communication; The power of Images; Visual Design Principles; Producing and Integrating Visuals, Telephonic conversations- answering telephonic calls, making calls, telephonic enquiries; Basic etiquette governing communication over phone. Topical and Informal discussions-group and pair work. Conducting interviews; framing relevant questions; probing for information; answering questions. | 10 |
| 4 | **Effective Interpersonal and technology integrated communication:**

 Group Communication- Meetings; Seminars and Conferences; Mastering Team and Interpersonal Communication- effective Team Communication; Advantages and Disadvantages of Teams; Collaborative Communication; Group Dynamics; Social Networks and Virtual Communities
 Technology integration in organizational communication; Tele and videoconference communications; various presentation platforms like vyond; storyboard etc. Feedback sharing- Effectively Sharing Feedbacks; Types of Feedbacks; engaging and Non engaging Feedbacks; Sharing and dealing with Negative Feedbacks, Conflict in interpersonal communication; role of conflict in communication; resolving conflict positively to enhance productivity and build relations | 8 |

5	**Reading and listening for Critical and analytical communication:**	7
	Reading Articles and eclectic passages- Discussion and analyses based on passages, Reading for vocabulary enhancement- Passage reading; specified articles, essays and books with a specific purpose to enhance vocabulary, followed up by vocabulary exercises, Reading for analyses and discussion- Analyzing the tone, purpose and content of specified piece of writing. Reading case studies and mini cases in communication followed by oral critical analyses and generating solutions, Listening meaning and importance; listening barriers and how to engage in Active listening Listening for Language Comprehension- Exposure to audio visual formats where Students listen purposefully to analyze the tone and content and meaning – to be followed up with analytical Discussions, Listening for picking up correct accent and pronunciation- Exposure to selective listening exercises for picking up and practicing correct accent and pronunciations Listening for vocabulary enhancement- Exposure to selective listening exercises with a specific purpose of enhancing vocabulary- followed up with vocabulary based exercises.	

Text Books:

1. John Seely, "Oxford Guide to Effective Writing and Speaking", Oxford University Press; Edition, 2013.
2. Scot Ober and Newman Amy, "Contemporary Business Communication", Biztantra Publications; 8th Edition, 2015.

Reference Books:

1. Inch. E.S., Warnick Barbara, "Critical Thinking and Communication", Pearson, 2011
2. Lesikar, "Business Communication", McGraw Hill Publications; 11th Edition, 2009.
3. Adler. Proctor; Communication Goals and Approaches; Cenage Learning; 2008.
4. Bovee, Courtland and Thill, John ; Business Communication Today; Pearson Education; 14th Edition, 2017.

Any other information:

Details of Internal Continuous Assessment (ICA)

Test Marks:20

Term Work Marks:30

Signature
(Prepared by Concerned Faculty/HOD)

Signature
(Approved by Dean)

Program: B. Tech Computer Science (Data Science)					Semester: I	
Course/Module: Engineering Graphics and Design					Module Code: BTCDS1006	
Teaching Scheme					**Evaluation Scheme**	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit		Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
0	2	0	1		Marks Scaled to 50	Marks Scaled to 50

Pre-requisite:

Objectives:

1. To impart knowledge about engineering design and its place in society.
2. To introduce the visual aspects of engineering design.
3. To familiarize the aspects of engineering graphics standards.
4. To be able to create solid models.
5. To apply computer-aided geometric design concepts and creation of working drawings.

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

1. Interpret and communicate drawings effectively using different types of solid models.
2. Apply the techniques, skills, and modern tools to create projections of machine components with the help of software.

Detailed Syllabus:

Unit	Description	Duration (hrs)
1	**Introduction to Engineering Drawing & Computer Graphics:** Principles of Engineering Graphics and their significance; Usage of Drawing instruments; lettering; numbering. Listing the computer technologies; Demonstrating knowledge of the theory of CAD software; use of standard toolbars like Draw, Modify, Dimensions and Annotations.	6

2	**Orthographic Projections:** Principles of orthographic projection- Conventions; Quadrant formation and Projections of points; Conversion of orthographic views to isometric views.	8
3	**Sectional Orthographic Projections** Principles of sectional orthographic projection; need of sectional views and sectional orthographic projection; types of sections; hatching of sectioned part; related rules and assumptions.	8
4	**Isometric Projections:** Principles of isometric projection; Isometric scale, Isometric views, Conventions; Isometric views of lines, planes; Simple and compound solids; Conversion of isometric views to orthographic views.	8

Text Books:

1. Engineering Drawing, 53 e, N. D. Bhatt, V. M. Panchal and P. R. Ingle, Charotar Publishing House, 2014.

Reference Books:

1.Engineering Drawing and Computer Graphics, 2 e, M. B. Shah and B. C. Rana, Pearson Education, 2009.

2.Engineering Drawing, 6 e, K. Venugopal, New Age International (P) Ltd. Publishers, 2011.

Any other information:
to websites: http://nptel.ac.in/courses/112103019/
Details of Internal Continuous Assessment (ICA)
Auto-CAD sheets   30 %
Mid Term   20 %
Term End Exam   50 %
   Total   **100 %**
Test Marks: 20
Term Work Marks: 30
*Note: Minimum Six drawing sheets to be completed in CAD practical session covering entire syllabus, by using suitable drafting software (AutoCAD).

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Program: B. Tech. Computer Science (Data Science)	Semester: I
Course/Module: Foundation of Business	Module Code: BTCDS1003

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	0	0	3	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite:

Objectives: To acquaint students with various facets of management

To sensitize students on social issues impacting society in general and business in particular

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

1. Appreciate decision-making and motivation skills.
2. Apply management principles in everyday practice in organizations.
3. Apply knowledge of business management for bettering organizations

Detailed Syllabus:

Unit	Description	Duration
1	**Business System and Contemporary Business Environment**: The role of Businesses in combining human, physical and financial resources to create goods and services. Private and public sector organizations. The main business functions and their roles: human resources, finance and accounts, marketing, operations. Primary, secondary, tertiary and quaternary sectors The nature of business activity in each sector and the impact of sectoral change on business activity. Forms of	3

	Business Organization including LLP. Emerging trends in business: outsourcing, service sector and e-commerce. External Business Environment- Macro & Micro Environment, Understanding Management Contexts- Constraints & Challenges, PESTEL analysis. **Development of Management Thought:** Management & Organizations, Management theories- Taylor, Fayol & Elton Mayo. Functions of Manager.	
2	**Planning and Decision Making:** Foundations of Planning, Managers as Decision makers. Types of decision- Programmed and Un-programmed decisions, concept of Rationality and bounded rationality in decision making, role of intuition in decision making. Steps in an effective decision-making process. **Tools and techniques for strategic analysis**: Porter's five force model, BCG matrix, TOWS matrix, Market life cycle model, impact matrix and the experience curve, generic strategies, strategy formulation, types of strategy.	3
3	**Organizations:** Formal and Informal Organization, Organization structures- mechanistic Vs Organic Structures, Types of structures Line and staff authority. Specialization, Centralization Vs Decentralization, Formalization. Structures with Narrow and wide spans.	3
4	**Foundations in Accounting** The accounting process preparation of financial statements for external users, techniques for analyzing a basic set of financial statements, using accounting information to support management decisions, and using time value of money techniques to evaluate capital asset decisions. **Accounting for Managerial Decisions:** Understand how managerial decisions are made in corporations using accounting data. Special emphasis is given to cost allocation, break-even analysis, ABC costing, product costing and budgeting decisions.	3
5	**Foundations in Finance** 1. Time Value of Money calculations 2. Understand differences in interest rates (due to differences in risk, horizon, and compounding) 3. Use present value	3

	calculations to solve bond pricing and risk applications 4. Use present value calculations to solve stock valuation applications.	
6	**Financial Management** time value of money, stock and bond pricing, develop a set of techniques for valuing capital investment projects in privately and publicly traded companies: (1) develops a set of investment criterion, (2) examine valuation techniques, (3) develop asset pricing models (the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) in particular) to determine the appropriate required or opportunity cost of capital for discounting future cash flows, (4) consider basic risk management techniques, (5) examine how firms raise capital, and (6) analyzes the effect of financing choices on shareholder wealth, firm value, risk, and tax payments. Real options and examine how real options are valued and affect capital budgeting decisions. The definition, use, and pricing of derivative securities such as financial options. What firms should do with the profits they generate given effective financial policies and decisions, the payout policy.	3
7	**Foundations in Economics** Microeconomics: supply and demand mechanism, how markets are affected by regulation and taxation, costs of production, and how market structure affects outcomes. Macroeconomics: the fundamental measures of the aggregate economy, the sources of economic growth, explaining short-run fluctuations in economic activity, and how government policies can affect these fluctuations. Fundamental economic principles at both the micro and macro level which can affect companies, investments, industries, and national economies.	3
8	**Marketing Foundations** Concepts such as segmentation, targeting, positioning, customer and market analysis, and basic marketing planning Holistic Marketing, Marketing Mix, -4P's, Need for Marketing Research-Quantitative, Qualitative.	3

9	**Introduction to Major Areas of HRM and OB:** Orientation to talent management – onboarding, recruitment , selection, appraisal, training, exit. Orientation to Organization development- Need for change, Resistance to change, how to overcome resistance to change, Kurt Lewin's process of change.	3
10	**Leadership and Motivation:** Leader Vs Manager, Leadership theories- Trait, Behavioral and Contingency theories of Leadership. Motivation Theories and application- Maslow's Need Theory, Mc Gregor's Theory X and Y, Herzberg's two factor theory, Victor Vroom Extrinsic and Intrinsic Reward systems. Groups Vs. teams, skills necessary to manage teams.	3
11	**Controlling:** Introduction to Controlling, Control process Measuring Organization Performance-Feed forward/Concurrent/Feedback Control, Financial Controls-Budget, Information Control, Balanced Scorecard, Benchmarking, Gantt, Milestone and PERT Charts.	**3**
12	**Introduction Business Ethics** **a) Business Ethics** Introduction to Business Ethics: Concept and Interpretation, Importance of Business Ethics, Personal Integrity at the workplace, Ethical Issues at Work, Costs Associated With Unethical Behaviors, Competitive Advantages of Ethical Organizations, Code of Ethics and a Code of Conduct **b) Human Nature :** Cognitive and Moral Development **Corporate Legal and Social Responsibility** Ethical and legal issues that arise in domestic and global business in the context of the employment relationship, financial decisions, environmental protections, and product development.	**3**
13	**Management of Operations** Introduction to Operations Management & Productivity of Operations. Defining Operations Function, Operations Management integrated with other business functions, Operation as a process to generate 'Goods' and 'Services'. Difference between 'Goods' and 'Services'.	**3**
14	**Introduction to Entrepreneurship**: Meaning and concept of entrepreneurship, role of entrepreneurship	**3**

	in economic development, entrepreneurship ecosystem-agencies in entrepreneurship management and future of entrepreneurship, women entrepreneurship The Entrepreneur: Meaning of entrepreneur/intrapreneur, the skills required to be an entrepreneur, the entrepreneurial decision process, and role models, mentors and support system.	
15	**Term Work Project Presentation**	**3**

Text Books:

1. Heinz Weihrich, Harold Koontz & Mark v Cannice, "Management-A global and Entrepreneurial perspective", Tata McGraw Hill Education Private Limited, 2013.
2. Robbins, S. P. & Coulter, M., "*Management*", Prentice Hall: New York, 2012.

Reference Books:

1. Koontz. H., "*Essentials of Management: International and Leadership Perspective*", McGraw Hill Education (India), 2012.
2. Peters, T., & Waterman, R.H., "*In Search of Excellence: Lessons From America's Best-Run Companies*" Profile Books Ltd, 2004
3. Drucker, P, "*The Practice of Management*", Harper Collins, 2006
4. Ramanathan, S, "*Accounting for Management*" New Delhi, Oxford university press, 2014
5. Philip Kotler *Marketing Management*, Pearson Publications 15th Edition.
6. Russel and Taylor, "*Operations Management*" 7th Edition; John Wiley, 2011

Any other information:

Details of Internal Continuous Assessment (ICA)

Test Marks: 20

Term Work Marks: 30

Signature   **Signature**
(Prepared by Concerned Faculty/HOD)   **(Approved by Dean)**

Program: B. Tech. Computer Science (Data Science)				Semester: I	
Course/Module: Introduction to Psychology				Module Code: BTCDS1005	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical** (Hours per week)	**Tutorial** (Hours per week)	**Credit**	**Internal Continuous Assessment (ICA) (Marks - 50)**	**Term End Examinations (TEE) (Marks- 50 in Question Paper)**
3	0	0	3	50	50

Pre-requisite: -

Objectives:

This course shall introduce students to the field of human psychology by focusing on behavioural research methods, analysis, theoretical interpretations, and applications. It shall also survey brain structures and functions, sensory mechanisms, developmental processes, classical and operant conditioning, social processes and cultural norms, approaches to psychotherapy, stress and coping, and applications of psychological science.

Outcomes: After completion of this course, students shall:

- Understand comprehensive overview of the field of psychology as well as its various sub-fields;
- Explain key psychological orientations, theories, and research practices;
- Discerning major themes and concepts across the span of the field;
- Understand historical and critical psychological perspectives.

Detailed Syllabus:

Unit	Description	Duration
1	**Introducing Psychology** - Psychology as a Science and Discipline - Introduction to Scientific Methods in Psychology - Literature Reviews - History of Psychology	3

2	**Biology, Sensation, Perception** • Biological Psychology • Neurological and Genetic Bases of Behavior • Human Development • Sensation & Perception • What is Consciousness?	**6**
4	**Cognition** • Learning & Memory • Language, Thinking & Intelligence • Cognition and Language • History of the Cognitive Approach in Psychology • Cognitive Therapies	**6**
5	**Therapy, Health and Creativity** • Psychological Disorders • Stress & Coping • Abnormal Psychology: Disorders and Treatments • Treatment Modalities • The Sociocultural Model and Therapy Utilization • Psychotherapy & Psychoanalysis	**9**
	Psychological Disorders • Techniques for Diagnosing and Classification • Anxiety & Mood Disorders • Schizophrenia, Psychosis & Dissociative Disorders • Personality Disorders	6
	Social Psychology & Personality • Social Psychology • Personality • Attitudes & Persuasion • Aggression & Pre-social Behavior • Workload and Workplace • Conformity & Compliance • Social Cognition	**6**
	Topics in Psychological Research • Classical & Operant Conditioning • Reinforcement, Punishment & Observational learning • Statistical Thinking • Research Ethics • Experimental Design	**9**

	• Respondent Behavior • Analysis of Data and Literature Reviews	
	Total	**45 Hours**

Text Books:

- James W. Kalat. (2015) *Introduction to Psychology* (11th Edition). CENGAGE Learning..

- Various Authors. (2020) *Introduction to Psychology.* Lumen Learning. As Retrieved on May 21st, 2020 from <https://courses.lumenlearning.com/wsu-sandbox/>

Reference Books:

- Stephen L. Franzoi. (2014) *Essentials of Psychology* (5th Edition). Redding, CA: BVT Publishing.

Signature   **Signature**
(Prepared by Concerned Faculty/HOD)   **(Approved by**
Dean)

Program: B. Tech. Computer Science (Data Science)				Semester: I	
Course/Module:	Introduction to business Analytics and Business intelligence			Module Code: BTCDS1001	

Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	0	0	3	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: -

Objectives:

- To understand common business information systems.
- To Learn spreadsheets for business visualization
- Describe what the term information systems ethics
- Using Basic tools to manage business information
- The student will learn to develop and design various types of charts and modify charts

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

1. Analyze the purpose, components, and issues related to common business information systems.
2. Plan, design, construct, modify and print a professionally designed and formatted spreadsheet
3. Describe information systems ethics
4. Apply Basic tools to manage business information

Detailed Syllabus:

Unit	Description	Duration

1	Strategic importance of IT as a resource: Theory about the strategic impact of the effective use of IT in achieving business objectives and its impact on work. Acquisition of EIS: Main decisions in acquiring EIS, roles and responsibilities, the business case, risks and risk management and ethical aspects. EIS Fundamental concepts: Basic EIS types, background, key components and properties of specific systems (e.g., Enterprise Resource Planning, Customer Relationship Management, etc.)	5
2	Management aspects of EIS: i.e., methods and approaches to EIS implementations, managing risks and critical success factors in EIS projects. Architectural aspects of IT systems: Overall structure of EIS software and its relation to organizational structure and business processes, new trends in EIS provisioning. Business intelligence and EIS. Working in groups for practical assignments	5
3	Construct, modify, and print a professionally designed and formatted Spreadsheet. Create and manipulate various types of charts and enhance charts with drawing tools. Create and use basic formulas and functions. Create and use complex and advanced formulas and functions from each category of functions provided by Excel.	5
4	Create macros, customize toolbars, and create command buttons tied to macros (VBA code). Create program code using Visual Basic for Applications and the VBA editor. Using named ranges, create a database and perform the following: sort, filter, advance filter, and extract.	5
5	Analyze lists and databases using database functions. Create Pivot tables; use Solver, Scenario, and Goal Seek for data analysis. Using Excel and OLE, share data with other applications. Using various Excel tools, perform what if	8

	analysis and projections on business data.	
6	Create 3D worksheets, 3D workbooks, and 3D formulas. Validate and control data entry. Perform trend analysis. Perform Web Queries. Explore and utilize the various tools provided by Excel for use in a business environment.	8
7	Dashboard Design using Excel for Business Use	5
8	Ethics in Information Systems	4

Text Books:

1. **Wayne Winston, "Microsoft Excel 2019 Data Analysis and Business Modeling (Business Skills)" eBook available, 2019**
2. **George W. Reynolds, "Ethics in Information Systems", CENAGE Learning, Fifth Edition 2018.**

Reference Books:

1. L. Motiwalla; J. Thompson, "Enterprise Systems for Management", 2nd Ed. Pearson, 2014.

2. Michael Alexander, John Walkenbach, **"Excel Dashboards and Reports", 2nd Edition, 2013.**

Any other information:

Details of Internal Continuous Assessment (ICA)

1. Practical's: Excel experiments (5 Marks)
2. Mini Project: Dashboard for given dataset (5 Marks)
3. Two Term Tests (20)

Test Marks: 20

Term Work Marks: 30

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Program: B. Tech. Computer Science (Data Science)					Semester: I	
Course/Module: Programming for Problem Solving					Module Code: BTCDS1007	
Teaching Scheme					Evaluation Scheme	
Class room Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credi	Continuous Evaluation (Marks-50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
30	2	0	2	3	Marks Scaled to 50	-

Course Rationale:

This course aims to teach the fundamental concepts of Procedural Programming. Students will develop skills related to problem solving by writing computer programs. This course does not require any prior programming experience.

Course Objectives:

- Enable students understand the basic concepts of Programming and help them build Programming Logic.

- Develop problem-solving skills using basic Programming constructs, Decision Making and Looping.

- Enable students solve complex problems using the knowledge of Arrays, Functions, Structures and Pointers.

Course Outcomes:

After completion of the course, students would be able to:

1. To formulate algorithms and draw flowcharts for arithmetic and logical problems.
2. To implement Decision Making, Nested Control Structures and Iterations.
3. To implement programs using Functions and concept of Recursion.

4. To implement programs using arrays, strings, structure, pointers, searching and sorting algorithms.	

Pedagogy:

Peer learning, Group exercises, quizzes, presentations and lecture method

Textbooks:

TB1. *Schaum's Outline Programming with C*, 3 e, Byron Gottfried, McGraw-Hill, 2017.

TB2. *Programming in ANSI C*, 7 e, E. Balaguruswamy, Tata McGraw Hill Education, 2017.

Reference Books:

RB1. *The C Programming Language*, 2 e, Brian W. Kernighan and Dennis M. Ritchie, Prentice
     Hall of India, 1988.

RB2. *Schaum's Outlines Data Structures*, Revised 1 e, Seymour Lipschutz, Tata McGraw Hill, 2014.

Links to websites:

* https://cprogrammingcodes.blogspot.in/2011/09/algorithms-and-flowchart.html

Evaluation Scheme:

* Tutorial Test/Presentation/viva/quiz   30%

* Mid Term   20%

* Term End Exam   50%

   Total   **100%**

Session Plan:

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
Unit 1	**Introduction to Programming**	--	--
1.	Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)	Lectures	**TB1:** Chapter 1: Introductory Concepts
2.	**Idea of Algorithm:** • Steps to solve logical and numerical problems. **Representation of Algorithm:**		**TB1:** Chapter 1: Introductory Concepts

	• Flowchart/Pseudo code with examples		
3.	**From algorithms to programs:** • Source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code		**TB1:** Chapter 2: Introduction to C programming **TB2:** Chapter 1: Overview of C Chapter 2: Constants variables and data types
Unit 2	**Basic Programming Constructs**	**--**	**--**
4.	**Operators**	• Lectures • Presentations • Quizzes	**TB1,TB2:** Chapter 3: Operators and expressions **TB1:** Chapter 5: Control Statements **TB2:** Chapter 5: Decision making and branching
5.	**Expressions**		
6.	**Decision making and Branching:** • If statements and if else statement		
7.	**Nesting of if else statements and Else if ladder**		
8.	**Switch statements**		
9.	**Continue statement Break statement**		
10.	**Looping – while**		**TB1:** Chapter 6: Control Statements **TB2:**
11.	**do-while**		
12.	**For loops**		
13.	**For loops and Finding roots of equations**		

14.	**Nested loops**		Chapter 6: Decision making and looping
Unit 3	**Arrays and Strings**	**--**	**--**
15.	• Concept, declaration, initialization • Accessing array elements of one-dimensional array	• Lectures • Problem Solving • Quizzes	**TB1:** Chapter 9: Arrays **TB2:** Chapter 7: Arrays
16.	**One-dimensional array**		
17.	• Concept, declaration, initialization • Accessing array elements of two-dimensional array		
18.	**Two - dimensional array**		
19.	**Introduction to strings**		
Unit 4	**Functions**	**--**	**--**
20.	**Function** • Introduction and need of user defined functions	• Lectures • Problem Solving • Quizzes	**TB1:** Chapter 7: Functions **TB2:** Chapter 9: User defined functions
21.	• Defining a Function • Function calls and declaration		
22.	**Category of functions:** • No argument and no return value • Argument but no return value		
23.	**Category of functions:** • Argument with return value • No argument but return value		
24.	**Passing arrays to functions**		**TB1:** Chapter 9: Arrays **TB2:** Chapter 9: User defined functions, Character arrays and strings
25.	Declaring & initialising string variable, Reading & writing strings		
26.	String handling functions		
27.	Passing strings to functions		

Unit 5	**Recursion**	--	--
28.	**Introduction to Recursion** • Recursion as a different way of solving problems adjoint method	• Lectures • Problem Solving • Presentation	**TB1:** Chapter 7: Functions **TB2:** Chapter 9: User defined functions
29.	**Recursion programs:** • Examples - Finding Factorial, Fibonacci series		
30.	**Recursion programs:** • Examples GCD, Merge sort.		
Unit 6	**Structures**	--	--
31.	• Defining a Structure Declaring structure variables • Accessing structure members • Structure Initialization	• Lectures • Problem Solving • Quizzes • Presentation	**TB1:** Chapter 11: Structure and unions **TB2:** Chapter 10: Structure and unions
32.	Array of Structure		
33.	Structure within structure		
34.	Difference between Structure and Unions		
Unit 7	**Pointers**	--	--
35.	• Idea of pointers • Defining pointers	• Lectures • Problem Solving • Quizzes • Presentation	**TB1:** Chapter 10: Pointers **TB2:** Chapter 11: Pointers
36.	Call by value and call by reference		
37.	Use of Pointers in self-referential structures, Notion of linked list (no implementation)		**TB1:** Chapter 11: Structure and unions **TB2:** Chapter 13: Dynamic memory allocation and linked
Unit 8	**Basic Algorithms**	--	--
38.	Notion of order of complexity through example programs (no	• Lectures	

	formal definition required	• Problem Solving	
39.	Searching: Sequential search	• Quizzes	**RB2:** Chapter 9: Sorting and searching
40.	Basic Sorting Algorithms : Bubble sort	• Presentation	
41.	Insertion sort		
42.	Selection sort		
43, 44, 45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

Signature
(Prepared by Concerned Faculty/HOD)

Signature
(Approved by Dean)