SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Computer Science) – Cybersecurity					Semester : I	
Course Module:		Engineering Mathematics - I			Module Code: BTCY01001	
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: Basic concepts in Algebra, pre-calculus.

Objectives:

1.To in still in prospective engineers knowledge of techniques in calculus and linear algebra.

Outcomes:

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

1. Demonstrate understanding of fundamental concepts of linear algebra.
2. Carry out computational techniques of linear algebra to solve related problems.
3. Solve problems based on the concepts of differential and integral calculus.
4. Demonstrate understanding of the applications of calculus and algebra.

Detailed Syllabus:

Unit	Description	Duration
1	**Matrices and Determinants:** Introduction to Matrices and Determinants; Inverse of a matrix by adjoint method; Rank of a matrix by echelon form, Linear dependence and linear independence of vectors, Solving Systems of Linear Equations using the tools of Matrices.	8
2	**Vector Space:** Vector space, Dimension, Basis, Linear transformations, Matrix associated with a linear map, Range and kernel of a linear map, Rank-nullity theorem, Inverse of a linear transformation.	11
3	**Eigen Values and Vectors:** Eigen values and eigen vectors of a square matrix, Similar matrices, Diagonalisation of a matrix, Application of diagonalisation.	7
4	**Differential Calculus:** Mean value theorems, Maxima and minima of one variable functions,	

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		10
	Taylor's theorem, Partial derivatives: First and second order partial derivatives of a function, chain rule, Second derivative test for maxima ,minima and saddle points of two variable functions.	10
5	**Integral Calculus:** Multivariate integration: Double integrals (Cartesian), Change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes.	9
	Total	45

Text Books:

1. D. Poole, "Linear Algebra: A Modern Introduction", Brooks/Cole, 3rd Edition, 2010.
2. B.V. Ramana, "Higher Engineering Mathematics", McGraw Hill Education, 1st Edition, 2017.
3. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publication,44th Edition.

Reference Books:

1. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, 10th Edition, 2017.

2. Gilbert Strang, "Introduction to linear algebra", Wellesley- Cambridge Press, 5th Edition, 2016.

Any Other information :

Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work : As per Institute norms.

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Program: B. Tech. (Computer Science - Cybersecurity)		Semester : I	
Course Module :	Basic Electrical & Electronics Engineering	Module Code: BTCY01002	

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	2	1	5	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: NIL

Objectives:
1. Equip the student to understand and solve simple ac and dc electrical and magnetic circuits using different theorems.
2. To enable the student to obtain a basic understanding of the working principle and applications of electronics devices.
3. To impact hands-on experience in assembling and testing of circuits.

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

1. Analyze dc circuits using network theorems.
2. Understand and analyze AC circuits.
3. Discuss the working principle and applications of transformer, DC and AC machines.
4. Understand the construction, working and principle of electronics devices.

Detailed Syllabus:

Unit	Description	Duration
1	**DC Circuits:** Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff's current law, Kirchoff's voltage laws, Analysis of simple circuits with dc excitation, Superposition Theorem, Thevenin's Theorems, Norton's Theorems. Time-domain analysis of first-order RL circuits.	8
2	**AC Circuits:** Representation of sinusoidal waveforms, peak and rms values, Phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R , L and C circuits, Analysis of series and parallel RLC circuits, Resonance (series and parallel resonant circuit), Three-phase balanced circuits, voltage and current relations in star and delta connections.	9

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3	**Transformers:** Magnetic materials, BH characteristics, Ideal and practical transformer, equivalent circuit, Losses in transformers, regulation and efficiency, Regulation and efficiency, Auto-transformer, Three-phase transformer connections	8
4	**Electrical Machines:** Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, Starting and Speed control of induction motor, Single-phase induction motor, Construction, working, torque-speed characteristic and speed control of separately excited dc motor, Construction and working of synchronous generators	8
5	**Introduction to Semiconductor Devices:** Introduction, basic principle and operation of devices - Diode, bipolar Junction transistor (NPN & PNP Transistor)	4
6	**Application to Semiconductor devices:** Basic concepts of rectifiers and its types, voltage regulators, amplifiers and oscillators, Basic concepts of operational amplifier and their applications.	8
	Total	45

Text Books:
1. D. C. Kulshreshtha, "Basic Electrical Engineering", 1st Ed, McGraw Hill Education, 2017.
2. E. Hughes, "Electrical and Electronics Technology", 10th Ed, Pearson Education, 2013.
3. Boylstead R.L., Nashelsky L., "Electronic Devices and Circuit Theory", Pearson, 12thEdition, 2012

Reference Books:
1. V. D. Toro, "Electrical Engineering Fundamentals", Pearson Education India 2nd Ed, PHI, 2015.
2. B. L. Theraja, "Fundamentals of Electrical Engineering and Electronics", S. Chand & Co, 24th edition, 2012
3. Jacob Millman & Halkias, "Electronic Devices & Circuits",Tata McGraw Hill second edition,2013.

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Any other information :

Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work: Tutorials/Quiz/Presentation/Viva or any other assessment

mechanism as per the requirement of the course.

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Program: B. Tech. (Computer Science) – Cybersecurity		Semester : I	
Course/Module :	Programming for Problem Solving	Module Code:BTCY01003	

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	4	0	5	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite:

Programming for Problem Solving

Objectives:

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.

Outcomes:

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

1. Formulate algorithms and draw flowcharts for a given problem
2. Implement decision making, control structures, and iterations
3. Implement programs using functions and recursion
4. Demonstrate the use of arrays, strings, structures, pointers, and file handling

Detailed Syllabus:

Unit	Description	Duration
1	**Introduction to programming:** Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.) Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/ Pseudocode with examples. From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code	4
2	**Basic Programming Constructs:** Operators, Expressions and precedence, Decision making and Branching, looping	11
3	Arrays and Strings: Arrays (1-D, 2-D), Character arrays and Strings	6
4	Functions: Introduction and need of user defined functions, defining a Function, Function calls and declaration, Category of functions, passing	

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	arrays to functions, Declaring & initialising string variable, Reading & writing strings, String handling functions, Passing strings to functions.	8
5	**Recursion:** Introduction, Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.	3
6	**Structures:** Defining a Structure Declaring structure variables, Accessing structure members, Structure Initialization, Array of Structure, Structure within structure, Difference between Structure and Unions	4
7	**Pointers:** Idea of pointers, Defining pointers, call by value, call by reference, pointer arithmetic, array of pointers, pointers and character strings	5
8	**File handling:** Introduction, opening and closing of files, I/O operations, random access to files	4
	Total	45

Text Books:
1. Byron Gottfried, " Schaum's Outline Programming with C", 3 e, McGraw-Hill, 2017.
2. E. Balaguruswamy, Programming in ANSI C, 8e, Tata McGraw Hill Education, 2019.

Reference Books:
1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2 e, PHI, 1988.
2. Tony Gaddis, "Starting Out with Programming Logic and Design", 5e, Pearson, 2019
3. Wiley Editorial, "Programming for Problem Solving", Wiley India, 2018
4. Behrouz A. Forouzan and Richard F. Gilberg, "Computer Science: A Structured Programming Approach Using C", Cengage India, 2012

Any Other information :
Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work : Tutorials/Quiz/Presentation/Viva

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Program : B. Tech. (Computer Science) – Cybersecurity	Semester : I
Course/Module : Introduction to Engineering	Module Code: BTCY01004

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	0	0	2	Marks Scaled to 50	--

Pre-requisite: NIL

Objectives : The objective of this course is to provide an introduction to the profession of engineering. This course discusses the process of engineering design and building on that process to introduce students to fundamental tools and concepts that are used by engineers in their work.

Outcomes:

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

1. Understand various engineering disciplines and common terminologies related to program
2. Understand engineering design process
3. Understand the importance of ethics in engineering design
4. Understand project management basics

Detailed Syllabus:

Unit	Description	Duration
1	**Introduction to engineering profession:** Engineering as a profession, difference between science, engineering, and technology, traits of a good engineer, Engineering disciplines, preparing for an engineering career	4
2	**Engineering Ethics:** Professional ethics, code of conduct, ethical decision making, and professional organizations	2
3	**Introduction to Engineering Design:** Engineering design process, sustainability in design, engineering economics, engineering standards and codes, design considerations	12
4	**Mathematics and statistics in engineering:** linear and non linear models, exponential and logarithmic models, matrix algebra, calculus, differential equations, probability theory,	6

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	frequency distribution and measure of central tendency	
5	**Logic and computers:** Moore's law. Evolution of computers, binary logic, truthtables, decimal and binary numbers, binary arithmetic and binary codes, working of computer.	2
6	**Project Management:** Introduction, protect management phases, WBS, Gantt Chart	2
7	**Introduction to Cybersecurity:** Cyberspace and cybersecurity, job roles in cybersecurity field, skill setsfor a cybersecurity professional, common terminologies and basic concepts.	2
	Total	30

Text Books:
1. Philip Kosky, Robert T. Balmer, William D. Keat, and George Wise, "Exploring Engineering: An Introduction to Engineering and Design", 4th Ed, Academic Press, 2015.
2. Saeed Moaveni, "Engineering Fundamentals: An Introduction to Engineering", 6th Ed, Cl-Engineering, 2019.

Reference Books:
1. Elizabeth A. Stephan et. al., "Thinking Like an Engineer: An Active Learning Approach", 4th Edition. Pearson, 2018
2. Mark N. Horenstein, "Design Concepts for Engineers", 5th Edition, Pearson, 2016
3. Don Norman, "The Design of Everyday Things", 2nd Ed, Basic Books, 2013
4. Raymond B. Landis, "Studying Engineering: A Road Map to a Rewarding Career",Discovery Press, 2013

Any Other information :
Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work : Tutorials/Quiz/Presentation/Viva or any other assessment mechanism as per the requirement of the course

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Program: B. Tech. (Computer Science) – Cybersecurity					Semester : I	
Course/Module :	Presentation and Communication Techniques				Module Code : BTCY01005	
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)
2	---	1	3	Marks Scaled to 50		---

Pre-requisite :NIL

Objectives :
- To impart an understanding of basic tenets of business communication that helps students to effectively engage in organizational communication.
- To develop in students an understanding of interpersonal communication challenges and the ability to effectively overcome these challenges in an organizational context.
- To develop leadership, team building and decision making skills which could be later applied in a professional set up.
- To impart technical writing skills towards designing and structuring persuasive technical communication.
- To build and strengthen presentation skills towards making impressive and persuasive presentations.
- To train the students for participating in group discussions, building Resume and facing personal interviews.

Outcomes:
After completion of the course, students would be able to :
1. Understand and apply the postulates of technical writing in a formal set up
2. Apply fundamentals of business correspondence to create well-structured Resumes, application letters, Minutes of Meetings and similar business related documents
3. Understand and analyse group dynamics and apply leadership skills for effective team building in professional set ups.
4. Analyze the context and select appropriate communication techniques for effective interpersonal communication in professional context.

Detailed Syllabus:

Unit	Description	Duration
1	Understanding the foundations of Business Communication: Professional Communication in a Digital, Social, Mobile World	5
2	Collaboration, Interpersonal Communication and Business Etiquette: Communicating effectively, collaborating, conducting productive meetings, using meeting technologies, improving listening skills and non-verbal communication, business etiquettes.	5
3	Development of Interpersonal and Group Communication Skills:	

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	Theatre techniques: Use of drama (in workshop format) to promote meaningful, active and reflective thinking processes as well as enhancing communication skills development. **Group Communication** • Forms of Group Communication; Use of body language in Group communication • Group Discussion etiquette: Introducing oneself and others; Expressing Opinions and Ideas; expressing disagreement etc. Group Discussion Strategies: Speaking, taking turns, Creating a Cordial and cooperative atmosphere etc.	5
4	**Employment Communication:** • Personal Interviews-Objectives, Types, Stages of Interview • Interview Preparation-types of Interview Questions; Interview Follow ups • Resume- Types and Format; Cover letters • Mock Interviews (simulation)	4
5	**Organizational networks and communication Structures:** • Process and Functions of Communication; Formal Networks in Organizational Communication • Informal networks of organizational communications ;choice of communication channels	4
6	**Meetings:** • Meetings- Purposes ,Importance and Meeting Procedures including Chairperson's and participants' roles, Meeting Documentation (Minutes of resolution; Minutes of Narration; Meeting Notice and Agenda)	2
7	**Technical Report Writing :** • Importance, objectives and Characteristic of Reports; Types of Reports • Report formats and Structure -Memo Reports; Letter Reports; Office Orders and Manuscript Reports	2
8	**Presentation Skills:** • Planning and structuring Presentations; Visual Aids in Presentations • Applications of MS Power Point Audience analyses; Nuances of Delivery; Modes of delivery; Controlling Nervousness and stage fright	3
	Total	30

Text Books:
1. Bovee, C., Thill, J., & Roshan Lal Raina (2013). Business Communication Today (14th ed.). Pearson.
2. Meenakshi Raman and Sangeeta Sharma (2015), Technical Communication Oxford University Press,3rd Edition

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Reference Books:

1. Fred Luthans (2013), 'Organizational Behavior', McGraw Hill, 12th Edition

Any other information :

1. Links to websites:

- https://www.mindtools.com/
- https://www.pearsonmylabandmastering.com/northamerica/mybcommlab/

2. Pedagogy:

- Classroom teaching
- classroom exercises and discussion
- case studies
- written assignments
- presentations and role play

Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work :

- Group/Individual presentations
- Report writing-Memo Reports and letter reports
- Drafting meeting Agenda and Minutes of Meeting
- Resume and Cover letter writing
- Group Discussion
- Mock Interviews

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Program: B. Tech. (Computer Science) - Cybersecurity				Semester : I	
Course/Module :	Physics			Module Code: BTCY01006	
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	2	0	4	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite: knowledge of 12th Grade level physics

Course Objectives:
1. To enable students to understand the basic principles of electricity and magnetism, quantum physics thermodynamics and their applications.
2. To enhance the student's ability to apply the principles of Physics in solving engineering problems in everyday life.

Course Outcomes:
After completion of the course, students would be able to:
1. Describe different types of laser and optical fibers, its principle, properties and applications
2. Interpret the laws of electromagnetism and various terms related to electromagnetic properties of matter such as, permeability, polarization, etc.
3. Explain the basic laws related to quantum mechanics and apply them to solve simple quantum mechanical problems.
4. Understand the basics principles thermodynamics.

Detailed Syllabus:

Unit	Description	Duration
1.	**Laser and Fiber optics:** Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby Laser, CO_2 Laser, He Ne laser and Semiconductor lasers; Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in engineering. Fiber Optics: Introduction, optical fiber as a dielectric wave guide, total internal reflection, Numerical aperture and various fiber parameters, losses associated with optical fibers, Step and graded	12

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	index fibers, Application of optical fibers	
2.	**Quantum Mechanics** Introduction to Quantum Physics, Black body radiation, Explanation using the photon concept, Photoelectric effect, Compton effect, de Broglie hypothesis , Wave-particle duality, Born's interpretation of the wave function, Verification of matter waves, Uncertainty principle, Schrodinger wave equation (Time In-dependent form), Schrodinger wave equation (Time dependent form), Solution of Schrodinger wave equation, Particle in box, Quantum harmonic oscillator, Hydrogen atom.	12
3.	**Electromagnetism and Magnetic Properties of Materials** Laws of electrostatics, Electric current and the continuity equation, laws of magnetism, Ampere's Faraday's laws, Maxwell's equations, Polarization, Permeability and dielectric constant, Polar and non-polar dielectrics, Internal fields in a solid, Clausius-Mossotti equation, Applications of dielectrics, Magnetisation, Permeability and susceptibility, Classification of magnetic materials, Ferromagnetism, magnetic domains and hysteresis, Applications of magnetism	12
4.	**Thermodynamics** Zeroth law of thermodynamics, first law of thermodynamics, brief discussion on application of 1st law, second law of thermodynamics and concept of Engine, entropy, change in entropy in reversible and irreversible processes, third law of thermodynamics.	9
	Total	45

Text Books:
1. Beiser A (2015), "Concepts of Modern Physics", Tata McGraw Hill International, 7th edition (SIE).
2. David Halliday, Robert Resnick, Jearl Walker (2018), "Fundamentals of Physics", Wileyplus, 11th Edition.

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Reference Books:

1. Sears &Zemansky, (2017) "University Physics", Pearson Education, Addison-Wesley, 14th Edition.
2. R. Eisberg and R. Resnick, (2013) "Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles", John Wiley & Sons, Indian Reprint, 2nd edition
3. D. J. Griffiths, (2015) "Introduction to electrodynamics", Pearson Education Limited, 4th edition

Any other information:

Total Marks of Internal Continuous Assessment (ICA): 50Marks

Description of ICA	Marks
Class Test Marks	20
Term Work Marks	30
Total Marks	50

Details of Term work:
1. Assignments
2. Laboratory experiments
3. Viva/practical exam

Signature
(Prepared by Concerned Faculty/HOD)