FACULTY OF SCIENCE

B.Sc. Computer Science, Mathematics, Electronics

Programme Educational Objectives

PEO1: To empower the students with current trends in computational sciences.

PEO2: To familiarize the students with mathematical concepts and tools.

PEO3: To equip the students with knowledge and skills in electronics.

PEO4: To nurture the students with employability skills and professional ethics.

Programme Outcome

After the successful completion of three year B.Sc. CSME Programme, the graduate will be able to:

PO1: apply professional and social skills to cater to the needs of the industry, society and global scientific community.

Programme Specific Outcomes

After the successful completion of three year B.Sc. CSME Programme, the graduate will be able to:

PSO1: Apply logical reasoning and algorithmic solutions to national and global computational problems.

PSO2: Develop capability in mathematical reasoning and problem solving.

PSO3: Create electronic devices to meet global technological demands.

PSO4: Perform effectively with professional ethics in analytic, scientific and technical domains.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

I Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A11	**Additional English I**	1. Describe and differentiate between ballads and sonnets 2. Analyze critically the writing style of prose writers 3. Develop interest to appreciate one act plays 4. Apply the rules of punctuation to write concisely 5. Demonstrate proficiency in creating leaflets and brochures
AECC	HIN103B11	**Hindi I**	• हिन्दी साहित्य के गद्य विधाओं का विश्लेषण करने की क्षमता का विकास • विद्यार्थियों में सामाजिक यथार्थ का मूल्यांकन करने का ज्ञान • सृजनात्मक कौशल्य में परिपूर्णता • गद्य विधाओं के अध्ययन करने के बाद सामाजिक मूल्यों का ज्ञान प्राप्त • अनुवाद कला और भाषा में परिशुद्धता
AECC	KAN103B11	**Kannada I**	• ಜಾನಪದ& ಶಿಷ್ಟ ಸಾಹಿತ್ಯದ ವೃತ್ಯಾಸಚರ್ಚೆ ಮಾಡುವರು • ಸಾಮಾಜಿಕ ಸಮಾನತೆ ಮತ್ತು ಜೀವನಮೌಲ್ಯಗಳ ಪುನರಾವಲೋಕನ ಮಾಡುವರು • ಗ್ರಾಮೀಣ ಸಂಸ್ಕೃತಿಯನ್ನು ವಿವರಿಸುವರು • ಕನ್ನಡ ಭಾಷಾಪ್ರೇಮವನ್ನುಇತರೆ ಭಾಷೆಗಳೊಂದಿಗೆ ಹೋಲಿಕೆ ಮಾಡುವರು
AECC	ENG103A11	**English I**	1. To attune young minds to concerns and issues which have a broad and wide scope of use and application to life. 2. To cut across the history of creative expression in focusing primarily on the core values that governs human lives.
DSCC	CSC203A11	**Computer Science I [Programming in C]**	1. Design flowchart and algorithms for C program. 2. Construct sequential, iterative problems and input/output operations on text files. 3. Differentiate between decision control structures and loop control structures. 4. Distinguish between data representation through arrays, functions, function using pointers, structures and unions.
DSCL	CSC2L1A11	**Computer Science Practical I**	1. Trace sequential, decision making and iterative C programs. 2. Design user defined data types and functions in C language.
DSCC	UMT204B11	**Mathematics I [Calculus and Analytical Geometry]**	1. Construct nth derivative of $f(z)=uv$ using Leibnitz's Theorem. 2. Evaluate partial derivatives of algebraic and transcendental functions. 3. Evaluate integrals using reduction formula. 4. Use the equations of line, plane, sphere, cone and cylinder.
DSCC	ELE203A11	**Electronics I [Basic Electronics I]**	1. Demonstrate the working and concept of solid state electronics. 2. Analyze analog electronic circuits using discrete components. 3. Differentiate transistor based amplifier circuits as per the given specification.
DSCL	ELE2L1A11	**Electronics Practical I**	1. Construct current and voltage based circuit theorems. 2. Design filters and oscillators electronic circuits using operational amplifiers.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

II Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A21	Additional English II	1. To provide the young learners an introduction to new ideas and issues that bear relevance to our life today. 2. To give the students an opportunity to develop values that will help them adapt to the changing world.
AECC	HIN103B21	Hindi II	• काव्य अध्ययन मे संगीतात्मक शैली को समझ लेता है • काव्य विश्लेषण करने की क्षमता • काव्य में निहित विचारों का मूल्यांकन • काव्य सृजन करने का कौशल्य • व्याकरणिक भाषा का ज्ञान एवं स्पष्टता
AECC	KAN103B21	Kannada II	• ಕನ್ನಡ ಸಾಹಿತ್ಯದಲ್ಲಿನ ಭಾಷಾ ಮಡಿವಂತಿಕೆಯ ವಿವರಣೆ ತಿಳಿಯುವರು • ಮರಣ ಕಾವ್ಯಗಳಲ್ಲಿನ ಸಾಂಸ್ಕೃತಿಕ ಮುಖಾಮುಖಿಯ ವಿಶ್ಲೇಷಣೆ ಮಾಡುವರು • ನಾಟಕಗಳಲ್ಲಿನ ಪರಿಸರ ವರ್ಣನೆಯ ಮನರಾವಲೋಕನ ಕೈಗೊಳ್ಳುವರು • ವೃತ್ತಿಆಧಾರಿತ ವ್ಯವಸ್ಥೆ ಬಗ್ಗೆ ಚರ್ಚಿಸುವರು
AECC	ENG103A21	English II	1. Discuss the use of animal imagery and hypersensitive characters in the twentieth century writings 2. Describe poetic style and its devices in the english verses of the victorian age 3. Analyze poems and sonnets regarding existentialist and metaphysical themes 4. Discover and implement new strategies of grammar in speaking english language 5. Integrate the prominence of media and the elements of advertising by creating media awareness
AECC	NES102A01	Environmental Science	1. Discuss the overexploitation of natural resources. 2. Appraise the components of the ecosystem. 3. Assess the conservation of biodiversity. 4. Criticize the mitigation process of natural disasters. 5. Survey the effects of pollution in the environment. 6. Recommend the various policies for the betterment of the environment.
DSCC	CSC203A21	Computer Science II [Data Structures]	1. Explain data structures, dynamic memory management and usage of pointer variables. 2. Differentiate operations associated with arrays, linked lists, stacks, queues and trees. 3. Design recursive procedures, sorting and searching algorithms for data structure applications.
DSCL	CSC2L1A21	Computer Science Practical II	1. Write programs explaining the data structures operations. 2. Develop programs for searching and sorting techniques. 3. Execute recursive functions for tower of Hanoi and binomial coefficient.
DSCC	UMT204B21	Mathematics II [Algebra and Differential Calculus]	1. Identify algebraic structures as groups. Construct pedal equation, radius of curvature and evolute. 2. Explain singular point, asymptote and envelope. 3. Solve first order linear and homogeneous differential equations.
DSCC	ELE203A21	Electronics II [Basic Electronics II]	1. Explain the working and concept of special transistor devices JFET, MOSFET, UJT. 2. Demonstrate the working of transistors as a power amplifier, oscillator and feedback amplifier. 3. Summarize the inverting, non-inverting and mathematical operations of op-amp.
DSCL	ELE2L1A21	Electronics Practical II	1. Develop mathematical operational circuits with inverting and non-inverting amplifier. 2. Design filters and oscillators electronic circuits using operational amplifier.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

III Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A31	**Additional English III**	1. Appreciate the theme of love and suspense in the works of Alfred Noyes, Robert Southey, Sir Arthur Conan Doyle and Shakespeare 2. Discover the sufferings of human being in the works of Tagore, Mary Fisher, Charley Chaplin, John Stainbeck and Philip Larkin 3. Analyses the dramatic techniques in the prescribed one act play 4. Outline the difference between essay writings and precis writing 5. Develop the interest on poem and prose
AECC	HIN103B31	**Hindi III**	• हिन्दी कविता और खण्डकाव्य के भेद को समझलेता है • पौराणिक कथा का विश्लेषण • पौराणिक आदर्श विचारों का अनुकरण करता है • आधुनिक और पौराणिक विचारों का मुल्यांकन • काव्य सृजन शैली का विकास
AECC	KAN103B31	**Kannada III**	• ಕನ್ನಡ ಸಾಹಿತ್ಯದ ವಿವಿಧ ಪ್ರಕಾರಗಳನ್ನು ಪರಿಚಯಿಸುತ್ತದೆ • ಮಧ್ಯಕಾಲೀನಯುಗದ ಭಕ್ತಿ ಪರಂಪರೆಯೊಂದಿಗೆ ಬದುಕಿನ ವಾಸ್ತವತೆಯನ್ನು ಹೋಲಿಸಿ ಚರ್ಚಿಸುವರು • ಭಾಷೆಯ ಕೌಶಲ್ಯಗಳೊಂದಿಗೆ ವಿಜ್ಞಾನ ಹಾಗೂ ತಾಂತ್ರಿಕ ಚಿಂತನೆಗಳನ್ನು ಗ್ರಹಿಸಲು ಅಗತ್ಯ ಕ್ರಮಗಳನ್ನು ಅರಿಯುವರು • ಯುವಜನಾಂಗವೂಅಭಿವೃದ್ಧಿಯಜಗತ್ತಿನಲ್ಲಿ ಹೊಂದಾಣಿಕೆಯಾಗಲು ಸಂವಹನ ಕೌಶಲ್ಯಗಳ ಅಗತ್ಯತೆಯನ್ನುಚರ್ಚಿಸುವರು • ಧರ್ಮ ಮತ್ತು ಪರಂಪರೆಗಳ ಕುರಿತು ಪುನರಾವಲೋಕನ ಮಾಡುವರು
Compulsory Courses			
AECC	ENG103A31	**English III**	1. State the problems of a man and the significance of parental affection in real life 2. Review the historical background of true events in roman history 3. Extrapolate the reflections on the lives of writers in literary genres 4. Interpret the significance of English literature in the forms of movies and serials in media 5. Formulate the structure of oral and written presentations and develop speaking skills
DSCC	CSC203A31	**Computer Science III [Java Programming]**	1. Compare Procedural and Object-oriented Programming Paradigms. 2. Construct windows and frame based GUI applications using control fundamentals. 3. Construct windows and AWT based applications using control fundamentals.
DSCL	CSC2L1A31	**Computer Science Practical III**	1. Build sequential, decision making and iterative Java programs. 2. Design GUI based applications using applets and frames.
DSCC	UMT204B31	**Mathematics III [Algebra, Differential Calculus, Improper Integrals and Linear Programming]**	1. Explain cyclic group and Lagrange's theorem. 2. Evaluate limit of algebraic and transcendental function using L' Hospital's Rule. 3. Evaluate integral using beta and gamma functions. 4. Formulate a given simplified definition as a linear programming problem and solve using graphical or simplex methods.

DSCC	**ELE203A31**	**Electronics III [Digital Electronics and Verilog]**	1. Explain the fundamental concept of Boolean algebra and logic gates. 2. Design all combinational and sequential logic circuits. 3. Compile digital circuit programs using circuit simulation software.
DSCL	**ELE2L1A31**	**Electronics Practical III**	1. Build the circuit with basic logic gates and universal gates. 2. Design combinational and sequential circuits using logic gates.
SEC	**SSP4L2A01**	**Soft Skills Practices**	1. Build verbal/oral communication, leadership and listening skills. 2. Perform group discussion, presentations and personal interview.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

IV Semester

Course Type	Course Code	Course Title	Course Outcome
AECC	AEN103A41	**Additional English IV**	1. Interpret select poems of Robert Frost, Sarojini Naidu and William Blake 2. Explain the style and significant features of prose writings of R. K Narayan, Willa Cather, Doris Lessing, O. Henry, and Booker. T. Washington 3. Compare the ethical and cultural differences in Wole Soyinka's play 'The Lion and the Jewel' and learn the unique native culture of Nigeria 4. Assess the issues related to marriage, education, moral code of conduct, the concept of sublime, modernity, tradition, and the mindsets of human beings in life 5. Appraise the literary devices and techniques used in poetry and prose 6. Formulate grammatically correct sentences using proper punctuations 7. Create citations of books, articles and journals using MLA format 8th edition
AECC	HIN103B41	**Hindi IV**	• हिन्दी व्यंग्य अध्ययन करने की शैली को समझलेता है • व्यंग्य में निहित विचारों का विश्लेषण • व्यंग्य कथाओं में अभिव्यक्त विचारों का मूल्यांकन • निबंधों में निहित आदर्श विचारों का अनुकरण करता है • व्यंग्य सृजन कौशल्य का विकास
AECC	KAN103B41	**Kannada IV**	• ನಮ್ಮ ನಾಡು–ಸಮಾಜ–ಕುಟುಂಬ ಪರಂಪರೆಯಕುರಿತುಅರಿವು ಹಾಗೂ ಕಾಳಜಿಯನ್ನು ಅಧ್ಯಯನಮಾಡುವರು • ಮಹಿಳಾ ಹಕ್ಕುಗಳು ಹಾಗೂ ರಕ್ಷಣೆಯಜವಾಬ್ದಾರಿಯನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ತಿಳಿಯುವರು • ಅರಣ್ಯ ಹಾಗೂ ನೈಸರ್ಗಿಕ ಸಂಪನ್ಮೂಲಗಳನ್ನು ವಿವಿಧ ವಿಷಯಗಳ ಅಧ್ಯಯನದೊಂದಿಗೆಚರ್ಚಿಸುವರು • ಭಕ್ತಿಯಅರ್ಥ, ಗ್ರಹಿಕೆಗಳು, ವಿವಿಧ ನೆಲೆಗಳು ಕುರಿತುಕಾಲಘಟ್ಟದ ಹಿನ್ನಲೆಯಲ್ಲಿ ಹೋಲಿಸುವರು • ಆದರ್ಶಗಳು, ಸಮಾಜಿಕ ಸೇವೆ ಈ ಕುರಿತು ಮೌಲ್ಯಾಧಾರಿತ ಬದುಕನ್ನುಕುರಿತು ಪುನರಾವಲೋಕನ ಮಾಡುವರು
Compulsory Courses			
AECC	ENG103A41	**English IV**	1. Recognize, define, and identify poetic terms and genres 2. Examine novels analytically and interpretively, to identify literary elements of plot, character, setting, tone, point of view, theme, style, symbol, metaphor, and image 3. Analyze the characters and themes of one act plays 4. Acquire vital employability skills and employment opportunities with in-depth knowledge of cv, cover letter, report writing and paragraph writing
DSCC	CSC203A41	**Computer Science IV [Internet Technology]**	1. Explain TCP/IP, HTTP protocols and directory services rendered by the internet. 2. Analyze the elements and attributes in HTML tags. 3. Develop webpages using HTML, JavaScript, XML and CSS.
DSCL	CSC2L1A41	**Computer Science Practical IV**	1. Design webpages using HTML, JavaScript and CSS. 2. Manage web pages using XML tags.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

DSCC	UMT204B41	**Mathematics IV [Algebra, Differential Equations, Laplace Transforms and Fourier Series]**	1. Analyze homomorphism and isomorphism of a group. 2. Solve second and higher order differential equations. 3. Evaluate Laplace transforms and inverse Laplace transforms. 4. Estimate Fourier series for even and odd functions.
DSCC	ELE203A41	**Electronics IV [Communication Systems]**	1. Demonstrate block diagram of basic communication system. 2. Explain transmitting and receiving function of analog modulation techniques. 3. Illustrate the concept of resonant and non-resonant antennas. 4. Appraise block diagram of monochrome and color televisions.
DSCL	ELE2L1A41	**Electronics Practical IV**	1. Design band elimination filters and modulator circuits. 2. Formulate sensitivity, selectivity and fidelity property of radio receiver.
NCCC	LSE5A2A41	**Life Skills Education**	1. Develop self-competency and confidence in their day to day life 2. Evaluate the problems and find the sustainable solutions in their daily life 3. Enhance interpersonal relationship effectively in the community 4. Develop coping mechanisms to manage their stress effectively in their environment

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

V Semester

Course Type	Course Code	Course Title	Course Outcome
DSCC	CSC204A51	**Computer Science V [DBMS and Visual Programming]**	1. Explain the concepts of relational data model, Normalization, database design, relational algebra and transaction processing. 2. Construct ER model for data tables and formulate SQL queries on data. 3. Design graphical user interface using arrays, functions and VB.Net controls. 4. Integrate connectivity between user interface and the database.
DSCL	CSC2L2A51	**Computer Science Practical V**	1. Design primary key, foreign key constraints and joins in the database. 2. Manage connectivity between user interface and the database.
DSCC	CSC204A52	**Computer Science VI [Operating System Concepts and LINUX]**	1. Compare batch, time sharing, and real time and distributed operating systems. 2. Explain system calls and operating system services. 3. Demonstrate CPU scheduling, disk scheduling, page replacement algorithms and process synchronization. 4. Analyze the critical section problems, deadlocks and storage management. 5. Design shell scripts using UNIX tools and utility commands.
DSCC	UMT204A51	**Mathematics V [Real and Complex Analysis]**	1. Categorize sequences and series to convergent, divergent or oscillatory. 2. Construct analytic functions from complex functions. 3. Evaluate integrals using Cauchy's integral theorem and formula. 4. Compare circles and lines in z-plane and w-plane.
DSCC	UMT204A52	**Mathematics VI [Total and Partial Differential Equations, Algebra and Numerical Analysis]**	1. Solve the partial differential equation of first order using Char pit's method and second order using complementary function and particular integral. 2. Identify rings, integral domain and field. 3. Apply numerical methods to perform interpolation and integration. 4. Solve algebraic and transcendental equations using bisection method, newton's method and secant method.
DSCL	UMT2L2B51	**Mathematics Practical I**	1. Create programs for sequences and series using the Maxima tool. 2. Develop solutions for algebraic, transcendental and partial differential equations using the Maxima tool.
DSCC	ELE203A51	**Electronics V [Advanced Communication Systems]**	1. Demonstrate the concept of pulse and digital modulation technique. 2. Explain the principle and working of the radar system. 3. Compare satellite communication, optical fiber communication and cellular communication system.
DSCL	ELE2L2A51	**Electronics Practical V**	1. Design PWM, PPM, PAM modulator and demodulator circuits. 2. Trace the waveform of BPSK, QPSK and FSK modulation using a kit.
DSCC	ELE203A52	**Electronics VI [Microprocessor and Microcontroller]**	1. Explain the concept and architecture of microprocessor and microcontroller. 2. Compose programs based on 8085 microprocessor and 8051 microcontroller. 3. Illustrate the concept of external peripheral interfacing with microcontrollers.
DSCL	ELE2L2A52	**Electronics Practical VI**	1. Develop programs to perform arithmetic operations using 8051 microcontrollers. 2. Execute interfacing with DAC, ADC and seven segment display.

Programme Matrix: Bachelor of Science- Computer Science, Mathematics, Electronics [2019 Batch]

VI Semester

Course Type		Course Code	Course Title	Course Outcome
DSCC		CSC204A61	Computer Science VII [Software Engineering]	1. Analyze software components and process models in software development life cycle. 2. Prepare the plan, design, schedule and assess the risks in project management. 3. Categorize software metrics, testing and maintenance of a project.
DSCL		CSC2L2A61	Computer Science Practical VII	1. Design project development phases using waterfall, prototyping, spiral and agile model. 2. Manage the workflow of the project using Gantt chart.
DSCP		CSC2P4A61	Enterprise Computing Project	1. Design a web-based application using .NET platform. 2. Create data flow and entity relationship diagrams. 3. Connect client applications with database servers.
DSCC		UMT204A61	Mathematics VII [Vector Calculus and Integral Calculus]	1. Use curl, divergence and gradient. Solve problems on line and multiple integrals. 2. Evaluate length, area and volume of curves using multiple integrals.
DSCC		UMT204A62	Mathematics VIII [Matrices, Linear Algebra and Calculus of Variations]	1. Evaluate rank, inverse, Eigen values and Eigen vectors of a matrix and solve a system of linear equations. 2. Explain vector space, subspace, linear span, basis and dimension. 3. Interpret linear transformation and fundamental concepts of rank nullity theorem. 4. Evaluate the extreme value of a functional.
DSCL		UMT2L2B61	Mathematics Practical II	1. Create programs for matrices and linear transformations using the Maxima tool. 2. Design Maxima programs to evaluate line and multiple integral.
DSCC		ELE203A61	Electronics VII [Digital Signal Processing]	1. Explain the concept of digital signals and discrete systems. 2. Analyze frequency domain data conversion. 3. Illustrate DSP programs using computation software.
DSCL		ELE2L2A61	Electronics Practical VII	1. Develop DSP programs to perform folding, shifting, convolution, correlation and DTFT properties. 2. Design Butterworth filters using computational software.
DSCP		ELE2P2A61	Electronics Project Work	1. Design and implementation of electronics projects using microprocessor and microcontroller. 2. Develop electronic projects based on filters, amplifiers and transducers.
Elective Courses [Any ONE to be opted]	DSEC	ELEA03A61	Electronics VIII [Biomedical Electronics]	1. Explain the function of the human body and generation of bio-electrical signals. 2. Demonstrate the function of electrodes and physiological transducers. 3. Illustrate biomedical recorders, modern imaging systems and patient monitoring systems.
	DSEC	ELEB03A61	Electronics VIII [Elements of Nanotechnology and Microwaves]	1. Demonstrate the basic concept of nanotechnology. 2. Explain the synthesis of nanomaterials and its applications. 3. Illustrate the fundamental concepts of microwave.
	DSEC	ELEC03A61	Electronics VIII [Instrumentation Devices and Systems]	1. Analyze the characteristic performance of variable resistance, capacitance, inductance and digital transducers. 2. Explain strain measurement and temperature measurement techniques. 3. Apply the concept of transducers for instrumentation amplifiers and data acquisition systems.