CO PO MAPPING – B.Sc MCCS

Semester	Course Code	Course Name	CO No.	Course Outcome	PROGRAM OUTCOMES														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I	ENG-I	English - I A Course in Communication and Soft Skills	CO1	Use grammar effectively in writing and Speaking.			2								2				2
			CO2	Demonstrate the use of good vocabulary.	2	2								2					
			CO3	Demonstrating of writing skills.	2						2								2
			CO4	Acquire ability to use Soft Skills in professional and daily life.	2	2								2				2	
			CO5	Confidently use the tools of communication skills.		2			2		3						3		
			CO6	Demonstrate good listening skills	2						2							2	2
	LSC-I	Life Skill Course - I Entrepreneurship Development (ED)	CO1	Recall the concept of Entrepreneurship, its applications and scope.	3	2					2							2	
			CO2	List the types of financial institutions that help the business at Central, State and Local Level.	2	3					1							2	
			CO3	Recall Central and State Government policies, A ware of various tax incentives.	2	3					2							1	
			CO4	Summarize on generating a broad idea for a starting an	3	1					2							2	

		CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			enterprise/start up.															
		CO5	Discuss on preparing a Project Report for a start up and differentiate between financial, technical analysis an business feasibility.	2	2					2							3	
		CO6	Operate data using charts and spread sheets.	3	2					3							1	
SDC-I	Skill Development Course - I Electrical Appliances	CO1	Able to explain basic electrical circuits, AC and DC fundamentals	3					2									2
		CO2	Analyse of Single Phase AC Circuits and Three phase circuits, the representation of alternating quantities and determining the power in these circuits	2					2		3							
		CO3	Illustrate the effects of electric shocks along with its remedies while using electrical appliances								2	2						2
		CO4	To select the various protective devices used in Electrical wiring	2	3				2									
		CO5	Able to acquire Basic Knowledge of various Electrical appliances like Refrigerator, Oven, Fan etc		2									2				3
		CO6	Able to understand the principle and operation of Illuminating devices,	2					2					2				2
C-IA	DIFFERNTIAL EQUATIONS	CO1	Solve linear differential equations.			2	2		3		3							
		CO2	Convert non exact homogeneous equations to exact differential equations by using integrating factors.			3	2	2			2							
		CO3	Know the methods of finding solutions of differential equations of the first order but not of the first Degree.	2			2	2			3							
		CO4	Solve higher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients.			3	2	2			3							

			CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			CO5	Demonstrate the concept and choose appropriate methods for solving differential equations.	2		3		3			3							2
			CO1	Recall the periodic table, properties of s,p,d and f block elements.	2		2	2											
			CO2	Learner will be able to interrupt and compare the properties of elements in various states.			2		2	2									3
	C-I	Inorganic and Physical Chemistry	CO3	Apply the concepts of gas equations, pH and electrolytes while studying other chemistry courses.			2	2				2							
			CO4	Learner will be able to characterize and analyse the properties of various states of matter.			2	2				2							
			CO5	Learner will be able to predict the molecular weights using colligative properties			2			2		2							
			CO6	Learner will be able to design the procedure for the separation of salt using common ion effect, solubility product.						2		2							2
			CO1	Explain the evolution and functionality of a digital computer.	2		2	2						3					
			CO2	Apply Logical skills to analyze a given problem.			2	3						2					3
	C-IC	Problem solving in C	CO3	Develop an algorithm solving given problem.			2	3	2	3									
			CO4	Demonstrate 'C' language constructs like iterative statements, Array processing, pointers.			3	3	2	2		2							
			CO5	Experiment 'C' language constructs to the algorithm to write a 'C' language program.	2			3	3					2					
II	ENG-II	English - II	CO1	Use reading skills effectively.	2	2									2				2
			CO2	Interpret different types of texts.	2		2			2									
			CO3	Characterize what is being read.	2	2									2				

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CO4 C05	Build up a repository of active vocabulary.		3					2				2				3
CO5	Use good writing strategies.	2		2				2								
CO6	Write well for any purpose.	2										2				
CO1	List the literature of social networks and their properties.	3									2	3				
CO2	Explain which network is suitable for whom.	2			2						3	2				
CO3	Discuss about the skills to use various social networking sites like twitter, flickr, etc.	2			2						3	3				
CO4	Write few GOI digital initiatives in higher education.	3									2	2				
CO5	Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.	3			2						2	2				
CO6	Compare internet threats and security mechanisms.	2			3						2	2				
CO1	Write the basics of survey and reporting needs and methods	3	3					2			1	1				
CO2	Discuss on designing of a questionnaire	2	3					2			1	1				
CO3	Demonstrate on a simple and valid survey and Collect data	2	3					3			1	2				
CO4 C05	Summarize on interpret data and submit report.	2	3					3			1	2				
CO1	Identify the types of business communication and correspondence	3	2								2	2				
CO2	List the processes like receiving, filing and replying	2	3								1	1				
CO3	Explain about preparing good business communications	2	3								2	2				
CO4	Write about organizational communication requirements and presentations.	3	1								1	2				

Course groupings:
- LSC-II — Life Skill Course - II Information and Communication Technology ICT
- SDC-II(A) — Skill Development Course - II Survey & Reporting
- SDC-II(B) — Skill Development Course - II Business Communication

			CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			CO5	Discuss search engine, payment gateways and SEO techniques.	3	2								1	2				
	C-2A	Three Dimensional Analytical Solid Geometry	CO1	Acquire the knowledge of planes.	2			2	2										2
			CO2	Explain basic idea of lines, sphere and cones.	2			2	2	3									
			CO3	Demonstrate the properties of planes, spheres and cones.	2		2	2	2			2							
			CO4	Express the problems geometrically and then to get the solution.			2	3	2	2									2
	C-2B	Organic And General Chemistry	CO1	Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.	2		2			2									
			CO2	Learner identify many organic reaction mechanisms including free radical substitution, electrophilic addition and electrophilic substitution.			2		2			2			2				
			CO3	Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt			2	2		2									2
			CO4	Apply the stereochemical concepts for different organic compounds and reactions.			2	2		2									3
			CO5	Learner can differentiate diastereomers and enantiomers.			2	2				2							
			CO6	Learner can predict the configurations of organic compounds based on D,L and R,S and E,Z configurational Rules.			2	2			2								2
			CO7	Learner can synthesize types of Alkanes , Alkenes , Alkynes.			2			2		2							3
	C-2C	Data Structures Using C	CO1	Demonstrate available data structure for data storage and processing.	2			2	2					2					

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CO2	Comprehend data structure and their real-time applications – stack, queue, linked list, trees and graph.			2	3	3	2				2					
CO3	Choose a suitable data structure for an application.			2	3	2	2			2	2					
CO4	Develop ability to implement different sorting and search methods.	2			3	2			3							2
CO5	Have knowledge on data structure basic operations like insert, delete, search, update and traversal.	2		3	2				2		3					3
CO6	Design and develop problems using various data structure.			2	2	2	2				3					
CO1	Speak fluently in English.	2	2					2							2	2
CO2	Participate confidently in any social interaction.		2					3							2	
CO3	Face any professional discourse.	2							2							
CO4	Demonstrate critical thinking.	2		2											2	
CO5	Enhance conversational skill by observing the professional interviews.		2			2		3							2	2
CO1	Demonstrate the nature, components of an ecosystem and that humans are an integral part of nature.			3			3	2	2	2						2
CO2	Outline healthy biodiversity and dependence of humans on environment.	2					2		3	2						3
CO3	Justify the ways and ill effects of destruction of environment, population explosion on ecosystems and global problems consequent to anthropogenic activities.				2		2			3			2	2		
CO4	Discuss the laws/ acts made by government to prevent pollution,			2							2			3		2

Row labels (left columns): ENG-III — English - III; III; LSC-III(A) — Life Skill Course - III Environmental Education (EE)

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	to protect biodiversity and environment a s a whole.															
CO5	Acquaint with international agreements and national movements, and realize citizen's role in protecting environment and nature.	2		3		2								2		3
CO1	Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.	2		2	2	2										
CO2	Acquire competency in the use of verbal reasoning.			2	2	2			2							2
CO3	Apply the skills and competencies acquired in the related areas.			2	2		2									
CO4	Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outstand the campus.			2	3	3	3									2
CO1	Identify the online business and its advantages and disadvantages	3	3					2			3	2			2	
CO2	Recall new channels of marketing, their scope and steps involved	3	3					2			2	1			2	
CO3	Summarize the procurement, payment process, security and shipping in online business	3	3					2			2	2			1	
CO4	Develop new marketing tools for online business	2	2					2			2	1			2	
CO5	List the search engine, payment gateways and SEO techniques.	3	2					3			3	2			2	
CO1	Acquire the basic knowledge and structure of groups, subgroups and cyclic groups.	2			2	2	3									
CO2	Get the significance of the notation of a normal subgroups.				2	2	3		2							

Row labels (left columns):

- LSC-III(B) — Life Skill Course - III Analytical Skills(AS) — covers CO1, CO2, CO3, CO4
- SDC-III — Skill Development Course - III Online Business — covers CO1, CO2, CO3, CO4, CO5
- C-IIIA — Abstract Algebra — covers CO1, CO2

			CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			CO3	Get the behavior of permutations and operations on them.				2	2										2
			CO4	Study the homomorphisms and isomorphisms with applications.			2	3	3			2							
			CO5	Demonstrate the ring theory concepts with the help of knowledge in group theory and to prove the theorems	2			2	2	3									
			CO6	Demonstrate the applications of ring theory in various fields.	2			2	2	3									
C-IIIB	Organic Chemistry And Spectroscopy		CO1	Students will be able to reproduce the preparation , properties and reactions of haloalkanes , haloarenes and oxygen containing functional groups	2		2	2				2							
			CO2	Learner can summarize different reaction mechanism of carbonyls and carboxylic acids	2			2							2				
			CO3	They can apply the synthetic chemistry learnt to do functional group transformations			2	2					2		2				3
			CO4	Learner will be able to differentiate between different types of spectroscopic techniques.	2		2					2							3
			CO5	Learner can conclude the structure of an organic compound using IR, UV-Visible and NHR spectroscopy	2		2		2										
			CO6	Will be able to formulate and propose the plausible mechanisms for any relevant reaction.	2		2					2							3
C-IIIC	Database Management System		CO1	Gain knowledge of data base and DBMS.	2			2	2			3							
			CO2	Demonstrate the fundamental concepts of DBMS with special emphasis on relational data model.			2	2		2				3					
			CO3	Demonstrating of normalization theory and apply such				2		2				3					2

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	knowledge to the normalization of a data base.															
CO4	Model data base using ER diagrams and design data base schemes based on the model.				2		2				3					2
CO5	Design a small database using SQL.				2		3		2		3					
CO6	Store, retrieve data in data base.				2	2	2				2					2
CO1	Get clear idea about the real numbers and real valued functions.	2		2	3	2	2									
CO2	Obtain the skills of analysing the concepts and choose appropriate methods for testing convergence of a sequence/ series.			2	3	2	2									
CO3	Test the continuity and differentiability and Riemann integration of a function.				2	2	2									3
CO4	Know the geometrical interpretation of mean value theorems.	3			2	2	2									2
CO1	Demonstrate the concepts of vector spaces, subspaces, basis's, dimension and their properties.	2			2	2	2									2
CO2	Demonstrate the concepts of linear transformations and their properties.	3		2	2	3	2									
CO3	Demonstrate Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods.			2	2	3										2
CO4	Learn the properties of inner product spaces and determine orthogonality in inner product spaces.	2			2	2										2
CO1	Learner can define the laws of absorption of light energy by molecules and can reproduce	2		2					2							3

Course groupings (leftmost columns):
- IV
- C-IV A1 — Mathematics Real Analysis (CO1–CO4)
- C-IV A2 — Linear Algebra (CO1–CO4)
- C-IV B1 — Inorganic, Organic and Physical Chemistry (CO1)

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	subsequent photochemical reaction															
CO2	an interpret the concept of Quantum efficiency and mechanisms of photochemical reactions.	2		2					2							
CO3	Will be able to solve the numericals in thermodynamics by applying the efficiency formula.			2	2							2				3
CO4	They can differentiate between two different carbohydrates (hexos) i.e Glucose and Fructose			2	2				2							
CO5	They will be able to predict the stability of carbonyl by applying 18 election rule.	2		2		2										3
CO6	Invent different proteins by linking different amino acids together.	2		2					2							
CO1	Can identify the order and molecularity of given reaction.	2		2					2							
CO2	They can understand concepts of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation values	2		2					3							
CO3	Will be able to apply the quantization to spectroscopy			3	2							2				2
CO4	Learner can analyse the structure by various types of spectra.	2		2					2			2				3
CO5	Can evaluate the stability of complexes by crystal field stabilization energy.	2		2		2										
CO6	Learner will be able to construct an electrochemical Cell.	2		2					2							3
CO1	Demonstrate the benefits of a well-structured program.	2			3	2					2					
CO2	Demonstrate different computer programming paradigms.			2	2	2					2					

(Row group labels: C-IV B2 — Inorganic and Physical Chemistry; C-IV C1 — Object oriented programming using java)

			CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			CO3	Demonstrate underlying principles of object –oriented programming in java	3		2	2	2					2					
			CO4	Develop problem-solving and programming skill using OOP concepts				2	2	3		2							2
			CO5	Develop the ability to solve real-world problems through software development high-level programming language like java				2	2		3		2			2				2
	C-IV C2	OPERATING SYSTEMS	CO1	Know computers system resources and the roll of operating system in resource management.	2			2	2					3					
			CO2	Demonstrate operating system architectural design and its services.	2			2	3	2									
			CO3	Gain knowledge of various types of operating system including Unix and Android.				2	3	2				2					
			CO4	Demonstrate various process management concepts including scheduling, synchronization, and deadlocks.				2	2	3	2								3
			CO5	Have a basic knowledge about multithreading.	2			2	2		3								
			CO6	Comprehend different approaches for memory management.				2	3		2								2
V	C-V A1	Numerical Methods	CO1	Demonstrate the subject of various numerical methods that are used to obtain approximate solutions	2			2	3	2		2							
			CO2	Demonstrate various finite difference concepts and interpolation methods.	2			2	2	2		3							
			CO3	Workout numerical differentiation and integration whenever and				2	2	2		2							2

CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	wherever routine methods are not applicable.															
CO4	Find numerical solutions of ordinary differential equations by using various numerical methods.	2			2	2			2							
CO5	Analyze and Justify the accuracy of numerical methods.	2			2	2	2									2
CO1	Demonstrate the Beta and Gamma functions, their properties and relation between these two functions, Demonstrate the orthogonal properties of Chebyshev polynomials and recurrence relations.	2			2	3										2
CO2	Find power series solutions of ordinary differential equations			3	2	2	2		2							
CO3	solve Hermite equation and write the Hermite Polynomial of order (degree) n, also find the generating function for Hermite Polynomials, study the orthogonal properties of Hermite Polynomials and recurrence relations.	2		2	2				2							
CO4	Solve Legendre equation and write the Legendre equation of first kind, also find the generating function for Legendre Polynomials, Demonstrate the orthogonal properties of Legendre Polynomials.				2	2	2		3							
CO5	Solve Bessel equation and write the Bessel equation of first kind of order n, also find the generating function for Bessel function Demonstrate the orthogonal properties of Bessel unction.				2	2	2		2							

C- V A2 — Mathematical Special Functions

Course	Course Name	CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C-V B1	Synthetic Organic Chemistry	CO1	Identify the importance of reagents used in organic synthetic reactions	2		2					2							
		CO2	Understand the importance of the retro synthesis in organic chemistry	2			2				2			2				
		CO3	Acquire knowledge on basic concepts in different pericyclic reactions	2		2	2				2							3
		CO4	Comprehend the application of the different reactions in the synthetic organic chemistry			2	2							2				
		CO5	Apply the concept of reagents in others chemical reactions				2				2			2				
		CO6	Learner will be able to prepare paracetamol from phenol				2				2			2				3
C- V B2	Analysis Of Organic Compounds	CO1	Identify the importance of mass spectrometry in the structure elucidation of organic compounds	2			2	2										
		CO2	Acquire the knowledge on structure elucidation of organic compounds	2			2	2			3							
		CO3	Understand the various chromatography methods in the separation and identification of the organic compounds and differentiate the nature of organic compounds				2	2						2				2
		CO4	Investigate types of organic compounds			2	2			2								
		CO5	Can be able to design easier separated methods from the knowledge gained in the solvent extractions for separation of organic compounds			2	2											3
C- V C1	Web Interface Designing Technologies	CO1	Demonstrate and appreciate the web architecture and services.	2			2	2					3					
		CO2	Gain knowledge about various components of a website.				3	2			3		2					
		CO3	Demonstrate skills regarding creation of a static website and an interface to dynamic website.				3	2					3					2

			CO No.	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			CO4	Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.	2			2	2					2					
C- V C2		Web Applications Development using PHP& MYSQL	CO1	Write simple programs in PHP.	2			3	2					2					
			CO2	Demonstrate how to use regular expressions, handle exceptions, and validate data using PHP.	2			2	2					3					
			CO3	Use Built functions and construct User defined functions in PHP programming.				3	2					3	2				
			CO4	Write PHP scripts to handle HTML forms.				2	2					2	2				
			CO5	Write programs to create dynamic and interactive web based applications using PHP and MYSQL.				2	3					3					
			CO6	Know how to use PHP with a MySQL database and can write database driven webpages.				2	3	2				3					2