Pre-Revision

Study & Evaluation Scheme

of

Bachelor of Science (Hons.) (Mathematics)

[Applicable for Academic Session 2018-19]

[Approved by Hon'ble VC dated August 08, 2017]

[With revision approved by VC date July 23, 2018, August 14, 2018, January 23, 2019 & November 29, 2019]

TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

TEERHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Bagarpur, Moradabad (U.P)

Teerthanker Mahaveer University, Moradabad 244001 Registrar

Study & Evaluation Scheme

Semester I

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS115	General Chemistry-I	4	-	-	4	40	60	100
2	BAS116	Algebra & Matrices	4	1	-	5	40	60	100
3	BAS117	Trigonometry & Differential Calculus	4	1	-	5	40	60	100
4	BCS111/ ECS212	Computer System & Programming in C++	3	-	-	3	40	60	100
5	BHM199/ EHM199	English communication & soft skill -I	1	1	2	2	50	50	100
6	BAS167	General Chemistry-I (Lab)	-	-	3	2	50	50	100
7	BCS161/ ECS262	Computer System & Programming in C++ (Lab)	-	-	2	1	50	50	100
8	BGP111	Discipline & General Proficiency	-	-	-	-	100	-	100
	Total		**16**	**3**	**7**	**22**	**410**	**390**	**800**

Registrar

Semester II

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS215	General Chemistry- II	4	-	-	4	40	60	100
2	BAS216	Vector calculus & Geometry	4	-	-	4	40	60	100
3	BAS217	Integral Calculus	4	-	-	4	40	60	100
4	BAS213/ BAS114	Mechanics	4	-	-	4	40	60	100
5	TMU201	Environmental Studies	1	2	-	2	40	60	100
6	BHM249/ EHM249	English Communication & Soft Skill-II	1	1	2	2	40	60	100
7	BAS264	General Chemistry- II (Lab)	-	-	3	2	50	50	100
8	BAS267/ BAS166	Mechanics (Lab)	-	-	3	2	50	50	100
9	BGP211	Discipline & General Proficiency	-	-	-	-	100	-	100
	Total		**18**	**3**	**8**	**24**	**440**	**460**	**900**

Semester III

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS314	Elements of Modern Physics	4	-	-	4	40	60	100
2	BAS315	Partial Differential Equation	4	1	-	5	40	60	100
3	BAS316	Modern Algebra	4	1	-	5	40	60	100
4	BAS317	Statistical Method	4	1	-	5	40	60	100
5	BHM349/ EHM349/449	English Communication & Soft Skills-III	1	1	2	2	40	60	100
6	BCS311/ ECS511/ 611/411/ MSC014	Database Management System	3	1	-	4	40	60	100
7	BGP311	Discipline & General Proficiency	-	-	-	1	100	-	100
	Total		**20**	**5**	**2**	**26**	**340**	**360**	**700**

Teerthanker Mahaveer University, Moradabad 244001
Registrar

Semester IV

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS415	Ordinary Differential Equation	4	1	-	5	40	60	100
2	BAS416	Real Analysis	4	1	-	5	40	60	100
3	BAS417	Discrete Mathematics	4	1	-	5	40	60	100
4	BAS418	Introduction to Probability	4	-	-	4	40	60	100
5	BHM499/ EHM599/699	English Communication & Soft Skills-IV	1	1	2	2	50	50	100
6	MOOC12	MOOC Program-I (Mandatory)	-	-	-	1/2	-	100	100
7	BGP411	Discipline & General Proficiency	-	-	-	1	100	-	100
	Total		**17**	**4**	**2**	**23/24**	**310**	**390**	**700**

Semester V

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS516	Numerical Analysis	4	1	-	5	40	60	100
2	BAS517	Applied Statistics	4	1	-	5	40	60	100
3	BAS518	Complex Analysis	4	1	-	5	40	60	100
4	BAS519	Operations Research	4	1	-	5	40	60	100
5	BAS565	Introduction to MATLAB	-	2	2	2	50	50	100
6	MOOC22	MOOC Program-II (Optional)	-	-	-	1/2	-	100	100
7	BGP511	Discipline & General Proficiency	-	-	-	1	100	-	100
	Total		**16**	**6**	**2**	**23**	**310**	**390**	**800**

Semester VI

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	BAS616	Fourier & Laplace Transform	4	1	-	5	40	60	100
2	BAS617	Differential Geometry and Tensor	4	1	-	5	40	60	100
3	BAS618	Number Theory	4	1	-	5	40	60	100
4	BAS619	Graph theory	4	1	-	5	40	60	100
5	**Open Elective**								
	BAS011	Introduction to Statistical Package for Social Sciences	3	-	-	3	40	60	100
	BAS012	Industrial Chemistry							
	BAS013	Introduction to Nano Science and Technology							
6	BAS698	Seminar, Viva & Presentation	-	-	4	2	50	50	100
7	BGP611	Discipline & General Proficiency	-	-	-	1	100	-	100
	Total		**19**	**4**	**4**	**26**	**350**	**350**	**700**

Registrar

Past Revision

Study & Evaluation Scheme

of

Bachelor of Science (Hons.) (Mathematics)

[Applicable for Academic Session 2019-20]

TEERTHANKER MAHAVEER UNIVERSITY

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

Teerthanker Mahaveer University, Moradabad-244001

Teerthanker Mahaveer University, Moradabad-244001 Registrar

Program Structure-B.Sc. (H) Mathematics

A. Introduction:

B.Sc. (H) Mathematics is an undergraduate degree program. Mathematics is the branch of structure, space, quantity, and change. This course provides in-depth knowledge about trigonometry, geometry, calculus and numerous other theories in Mathematics or respective disciplines, for example, computer science or statistics additionally to study of the normal Bachelor of Science subjects such as Physics and Chemistry. The duration of the course is three years and the syllabus for the course is divided into six semesters. This Honours course is an important and valuable one that provides opportunities to the candidates of taking some of the subjects of a Master's degree. After completing the course, they can go to many fields to obtain jobs.

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our University.

The following is the course module designed for the B.Sc (H) program:

- ***Core competency:*** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. We are offered core course in all semesters like operation research, Trigonometry & Differential Calculus, Algebra & matrix, Differential Calculus & Integral calculus etc with the 5 & 6 credit of each.

- ***Program/Discipline Specific Elective Course (DSEC):*** A graduate student is expected to be capable of demonstrating comprehensive knowledge and understanding of both theoretical and experimental/applied mathematics knowledge in various fields of interest like Statistics Software & Tools, Numerical Techniques & its lab etc.

- ***Skilled communicator:*** The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.

- ***Critical thinker and problem solver:*** The course curriculum also includes components that can be helpful to graduate students to develop critical thinking ability by way of solving problems/numerical using basic & advance knowledge and concepts of mathematics.

- ***Sense of inquiry:*** It is expected that the course curriculum will develop an inquisitive characteristics among the students through appropriate questions, planning and reporting experimental investigation.

- ***Skilled project manager:*** The course curriculum has been designed in such a manner as to enabling a graduate student to become a skilled project manager by acquiring knowledge about mathematical project management, writing, planning, study of ethical standards and rules and regulations pertaining to scientific project operation.

- ***Ethical awareness/reasoning:*** A graduate student requires understanding and developing ethical awareness/reasoning which the course curriculums adequately provide.

- ***Lifelong learner:*** The course curriculum is designed to inculcate a habit of learning continuously through use of advanced ICT technique and other available techniques/books/journals for personal academic growth as well as for increasing employability opportunity.

Study & Evaluation Scheme

Semester I

S. No.	Category	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	AECC	BAS115	General Chemistry-I	4	-	-	4	40	60	100
2	CC	BAS116	Algebra & Matrices	4	1	-	5	40	60	100
3	CC	BAS117	Trigonometry & Differential Calculus	4	1	-	5	40	60	100
4	AECC	BCS111	Computer System & Programming in C++	3	-	-	3	40	60	100
5	AECC	TMUGE101	English Communication -I	2	-	2	3	40	60	100
6	AEC	BAS167	General Chemistry-I (Lab)	-	-	4	2	50	50	100
7	AEC	BCS161	Computer System & Programming in C++ (Lab)	-	-	2	1	50	50	100
		Total		**17**	**2**	**8**	**23**	**300**	**400**	**700**

Value Added Course:
It is an audit course. The performance of the student in this course will not be counted in the overall result however the student has to pass it compulsorily with 45% marks.

1	VAC-1	TMUGA-101	Foundation in Quantitative Aptitude	2	1	-	-	40	60	100

Semester II

S. No.	Category	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	AECC	BAS215	General Chemistry- II	4	-	-	4	40	60	100
2	CC	BAS216	Vector calculus & Geometry	4	-	-	4	40	60	100
3	CC	BAS217	Integral Calculus	4	-	-	4	40	60	100
4	AECC	BAS213/ BAS114	Mechanics	4	-	-	4	40	60	100
5	AECC	TMU201	Environmental Studies	2	1	-	3	40	60	100
6	AECC	TMUGE201	English Communication-II	2	-	2	3	40	60	100
7	AEC	BAS262	General Chemistry- II (Lab)	-	-	4	2	50	50	100
8	AEC	BAS267/ BAS166	Mechanics (Lab)	-	-	4	2	50	50	100
		Total		**20**	**1**	**10**	**26**	**340**	**460**	**800**

***Value Added Course:**

1	VAC-2	TMUGA-201	Analytical Reasoning	2	1	-	-	40	60	100

Chaudhary Ranbir Mahaveer University, Muradabad (U.P.) Registrar

B.Sc. (H) (Mathematics)-Semester III

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC	BAS315	Partial Differential Equation	4	1	-	5	40	60	100
2	CC	BAS316	Modern Algebra	4	1	-	5	40	60	100
3	CC	BAS319	Numerical Analysis	5	1	-	6	40	60	100
4	AECC	TMUGE301	English Communication-III	2	-	2	3	40	60	100
5	AECC	BHM315	Human values & Professional Ethics	3	-	-	3	40	60	100
6	GEC		Generic Elective Course: Generic Elective-V	3	1	-	4	40	60	100
7	SEC		Skill Enhancement Course: Skill Enhancement Course –I	-	1	2	2	50	50	100
8	DGP	BGP311	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**21**	**5**	**4**	**28**	**290**	**410**	**700**

***Value Added Course:**

1	VAC-3	TMUGA-302	Modern Algebra and Data Management	2	1	-	-	40	60	100
2	VAC-4	TMUGS-301	Managing Self	2	1	-	-	50	50	100

Teerthanker Mahaveer University, Moradabad-244001 Registrar

B.Sc. (H) (Mathematics)-Semester IV

S. No	Category	Course Code	Course	Periods			Credit	Evaluation Scheme		
				L	T	P		Internal	External	Total
1	CC	BAS415	Ordinary Differential Equation	4	1	-	5	40	60	100
2	CC	BAS416	Real Analysis	4	1	-	5	40	60	100
3	CC	BAS432	Operations Research	5	1	-	6	40	60	100
4	AECC	TMUGE401	English Communication-IV	2	-	2	3	40	60	100
5	AECC	BHM415	Entrepreneurship	3	-	-	3	40	60	100
6	SEC		Skill Enhancement Course – Skill Enhancement Course –II	3	1	-	4	40	60	100
7	DGP	BGP411	Discipline & General Proficiency	-	-	-	-	100	-	100
			Total	**21**	**3**	**2**	**26**	**240**	**360**	**600**

***Value Added Course:**

1	VAC-5	TMUGA-402	Advance Algebra and Geometry	2	1	-	-	40	60	100
2	VAC-6	TMUGS-401	Managing Work and Others	2	1	-	-	50	50	100

MOOC Course:

1	MOOC-1	MOOC12	MOOC Program –I (Optional)	-	-	-	2	-	100	100

Teerthanker Mahaveer University, Moradabad-244001 Registrar

B.Sc. (H) (Mathematics)-Semester V

S. No	Category	Course Code	Course		Periods			Credit	Evaluation Scheme		
					L	T	P		Internal	External	Total
1	CC	BAS517	Applied Statistics		5	1	-	6	40	60	100
2	CC	BAS518	Complex Analysis		5	1	-	6	40	60	100
3	DSE		Discipline Specific Elective Courses	Discipline Specific Elective Course-I	5	1	-	6	40	60	100
4	DSE			Discipline Specific Elective Course-II	5	1	-	6	40	60	100
5	OEC		Open Elective Course	Open Elective-I	3	-	-	3	40/50	60/50	100
6	PROJ	BAS598	Industrial Training & Presentation		-	-	6	3	50	50	100
7	DGP	BGP511	Discipline & General Proficiency		-	-	-	-	100	-	100
			Total		**23**	**4**	**6**	**30**	**250/260**	**350/340**	**600**

MOOC Course:

1	MOOC-2	MOOC13	MOOC Program –II (Optional)	-	-	-	2	-	100	100

Teerthanker Mahaveer University, Moradabad 244001 Registrar

B.Sc. (H) (Mathematics)-Semester VI

S. No	Category	Course Code	Course		Periods			Credit	Evaluation Scheme		
					L	T	P		Internal	External	Total
1	CC	BAS619	Graph Theory		5	1	-	6	40	60	100
2	DSE		Discipline Specific Elective Courses	Discipline Specific Elective Course-III	5	1	-	6	40	60	100
3	DSE			Discipline Specific Elective Course-IV	5	1	-	6	40	60	100
4	OEC		Open Elective Course	Open Elective-II	3	-	-	3	40/50	60/50	100
5	PROJ	BAS698	Project		-	-	16	8	50	50	100
6	DGP	BGP611	Discipline & General Proficiency		-	-	-	-	100	-	100
			Total		18	3	16	29	210/220	290/280	500

ELECTIVE COURSES OFFERED

S. No	Code	Course	L	T	P	Credit
Semester III- Generic Elective V-(Any one)						
1	BAS314	Elements of Modern Physics	3	1	0	4
2	BCS311	Database Management System	3	1	0	4
Semester III- Skill Enhancement Course –I						
3	BAS367	Introduction to MATLAB	-	1	2	2
Semester IV- Skill Enhancement Course –II -(Any one)						
4	BAS426	Introduction to Statistical Package for Social Sciences	3	1	0	4
5	BAS431	Statistical Methods	3	1	0	4
Semester V- Discipline Specific Elective Course-I -(Any one)						
6	BAS531	Metric Space	5	1	0	6
7	BAS532	Integral Transform	5	1	0	6
8	BAS533	Discrete Mathematics	5	1	0	6
Semester V- Discipline Specific Elective Course-II -(Any one)						
9	BAS535	Dynamics	5	1	0	6
10	BAS536	Special Functions	5	1	0	6
Semester VI- Discipline Specific Elective Course-III -(Any one)						
11	BAS616	Fourier & Laplace Transform	5	1	0	6
12	BAS631	Mathematical Modeling	5	1	0	6
13	BAS632	Theory of Probability	5	1	0	6
Semester VI- Discipline Specific Elective Course-IV -(Any one)						
14	BAS633	Differential Geometry and Tensor	5	1	0	6
15	BAS634	Number Theory	5	1	0	6

New Course Added

Course Code: TMUGA-101	Value Added Course BSC- Semester-I **Foundation in Quantitative Aptitude**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Solving complex problems using criss cross method, base method and square techniques.	
CO2.	Applying the arithmetical concepts of Average, Mixture and Allegation.	
CO3.	Evaluating the different possibilities of various reasoning based problems in series, Blood relation and Direction.	
CO4.	Operationalizing the inter-related concept of Percentage in Profit Loss and Discount, Si/CI and Mixture/Allegation.	
Course Content:		
Unit-1:	**Speed calculations** Squares till 1000,square root, multiplications: base 100, 200 300 etc., 11-19, crisscross method for 2X2, 3X3, 4X4, 2X3, 2X4 etc., cubes, cube root	**2 Hours**
Unit-2:	**Percentages** Basic calculation, ratio equivalent, base, change of base, multiplying factor, percentage change, increment, decrement, successive percentages, word problems	**5 Hours**
Unit-3:	**Profit Loss Discount** Basic definition, formula, concept of mark up, discount, relation with successive change, faulty weights	**5 Hours**
Unit-4:	**SI and CI** Simple Interest, finding time and rate, Compound Interest, difference between SI and CI, Installments	**2 Hours**
Unit-5:	**Averages** Basic Averages, Concept of Distribution, Weighted Average, equations	**2 Hours**
Unit-6:	**Mixtures and allegations** Mixtures of 2 components, mixtures of 3 components, Replacements	**4 Hours**
Unit-7:	**Number and alphabet series** Number series, alphabet series	**2 Hours**
Unit-8:	**Blood relations** Indicating type, operator type, family tree type	**2 Hours**
Unit-9:	**Ranking** Linear ranking, complex ranking	**1 Hours**
Unit-10:	**Direction sense** Simple statements, shadow type	**1 Hours**
Unit-11:	**Cubes and dices** Concept of cubes, rotation type, Dices, regular dices, irregular dices	**4 Hours**
Text Book:	• Quantitative Aptitude by R.S. Agrawal	

Veer Mahaveer University, Moradabad (U.P.)
Registrar

New Course Added

Course Code: TMUGA-201	Value Added Course B.Sc. (H) Mathematics- Semester-II **Analytical Reasoning**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Applying the arithmetical concepts in Ratio Proportion Variation.	
CO2.	Employing the techniques of Percentage; Ratios and Average in inter related concepts of Time and Work, Time Speed and Distance.	
CO3.	Identifying different possibilities of reasoning based problems of Syllogisms and Venn diagram.	
CO4.	Examining the optimized approach to solve logs and Surds.	
Course Content:		
Unit-1:	**Ratio, proportions and variations** Concept of ratios, proportions, variations, properties and their applications	**5 Hours**
Unit-2:	**Time and Work** Same efficiency, different efficiency, alternate work, application in Pipes and Cisterns	**6 Hours**
Unit-3:	**Time Speed Distance** Average speed, proportionalities in Time, Distance, trains, boats, races, circular tracks	**6 Hours**
Unit-4:	**Logs and Surds** Concept and properties of logs, surds and indices	**4 Hours**
Unit-5:	**Coding and decoding** Sequential coding, reverse coding, abstract coding	**3 Hours**
Unit-6:	**Syllogisms** Two statements, three statements	**4 Hours**
Unit-7:	**Venn diagram** Basic concept and applications	**2 Hours**
Reference Books:	• R1:-Arun Shrama:- How to Prepare for Quantitative Aptitude • R2:-Quantitative Aptitude by R.S. Agrawal • R3:-M Tyra: Quicker Maths • R4:-Nishith K Sinha:- Quantitative Aptitude for CAT • R5:-Reference website:- Lofoya.com, gmatclub.com, cracku.in, handakafunda.com, tathagat.mba, Indiabix.com • R6:-Logical Reasoning by Nishith K Sinha • R7:-Verbal and Non Verbal Reasoning by R.S. Agrawal *** Latest editions of all the suggested books are recommended.**	

Registrar

New Course Added

Course Code: BHM315	B.Sc.(H) Mathematics- Semester-III **Human Values & Professional Ethics**	L-3 T-0 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the importance of value education in life and method of self-exploration.	
CO2.	**Understanding** 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration.	
CO3.	**Applying** right understanding about relationship and physical facilities.	
CO4.	**Analysing** harmony in myself, harmony in the family and society, harmony in the nature and existence.	
CO5.	**Evaluating** human conduct on ethical basis.	
Course Content:		
Unit-1:	Understanding of Morals, Values and Ethics; Introduction to Value Education- need for Value Education. Self- Exploration– content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration. Continuous Happiness and Prosperity- basic Human Aspirations. Gender Issues: Gender Discrimination and Gender Bias (home & office), Gender issues in human values, morality and ethics.	**8 Hours**
Unit-2:	Conflicts of Interest: Conflicts between Business Demands and Professional Ethics. Social and Ethical Responsibilities of Technologists. Ethical Issues at Workplace: Discrimination, Cybercrime, Plagiarism, Sexual Misconduct, Fraudulent Use of Institutional Resources. Intellectual Property Rights and its uses. Whistle blowing and beyond, Case study.	**8 Hours**
Unit-3:	Harmony in the Family and Society- Harmony in Human-Human Relationship, Understanding harmony in the Family- the basic unit of human interaction. Understanding values in human-human relationship; meaning of Nyaya; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman and other salient values in relationship.	**8 Hours**
Unit-4:	Understanding Harmony in the Nature and Existence – Whole existence as Co-existence. Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature. Understanding Existence as Coexistence (Sah-astitva) of mutually interacting units in all pervasive space. Holistic perception of harmony at all levels of existence.	**8 Hours**
Unit-5:	Implications of the above Holistic Understanding of Harmony on Professional Ethics. Natural acceptance of human values. Definitiveness of Ethical Human Conduct. Competence in professional ethics:	**8 Hours**

Registrar

New Course Added

Course Code: TMUGS-301	Value Added Course B.Sc.(H) Mathematics- Semester-III **Managing Self**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Utilizing effective verbal and non-verbal communication techniques in formal and informal settings	
CO2.	Understanding and analyzing self and devising a strategy for self growth and development.	
CO3.	Adapting a positive mindset conducive for growth through optimism and constructive thinking.	
CO4.	Utilizing time in the most effective manner and avoiding procrastination.	
CO5.	Making appropriate and responsible decisions through various techniques like SWOT, Simulation and Decision Tree.	
CO6.	Formulating strategies of avoiding time wasters and preparing to-do list to manage priorities and achieve SMART goals.	
Course Content:		
Unit-1:	**Personal Development:** Personal growth and improvement in personality Perception Positive attitude Values and Morals High self motivation and confidence Grooming	**10 Hours**
Unit-2:	**Professional Development:** Goal setting and action planning Effective and assertive communication Decision making Time management Presentation Skills Happiness, risk taking and facing unknown	**8 Hours**
Unit-3:	**Career Development:** Resume Building Occupational Research Group discussion (GD) and Personal Interviews	**12 Hours**
Reference Books:	1. Robbins, Stephen P., Judge, Timothy A., Vohra, Neharika, Organizational Behaviour (2018), 18th ed., Pearson Education 2. Tracy, Brian, Time Management (2018), Manjul Publishing House 3. Hill, Napolean, Think and grow rich (2014), Amazing Reads 4. Scott, S.J., SMART goals made simple (2014), Createspace Independent Pub 5. https://www.hloom.com/resumes/creative-templates/ 6. https://www.mbauniverse.com/group-discussion/topic.php 7. Rathgeber, Holger, Kotter, John, Our Iceberg is melting (2017), Macmillan 8. Burne, Eric, Games People Play (2010), Penguin UK 9. https://www.indeed.com/career-advice/interviewing/job-interview-tips-how-to-make-a-great-impression *** Latest editions of all the suggested books are recommended.**	

New Course Added

Course Code: TMUGA-302	Value Added Course B.Sc. (H) - Semester-III **Modern Algebra and Data Management**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Applying the concepts of modern mathematics Divisibility rule, Remainder Theorem, HCF /LCM in Number System.	
CO2.	Relating the rules of permutation and combination, Fundamental Principle of Counting to find the probability.	
CO3.	Applying calculative and arithmetical concepts of ratio, Average and Percentage to analyze and interpret data.	
CO4.	Correlating the various arithmetic concepts to check sufficiency of data	
Course Content:		
Unit-1:	**Number theory** Classification of Numbers, Divisibility Rules, HCF and LCM, Factors, Cyclicity(Unit Digit and Last Two digit), Remainder Theorem, Highest Power of a Number in a Factorial, Number of trailing zeroes	**8 Hours**
Unit-2:	**Data interpretation** Data Interpretation Basics, Bar Chart, Line Chart, Tabular Chart, Pie Chart, DI tables with missing values	**7 Hours**
Unit-3:	**Data Sufficiency** Introduction of Data Sufficiency, different topics based DS	**5 Hours**
Unit-4:	**Permutations and combinations** Fundamental counting, and or, arrangements of digits, letters, people in row, identical objects, rank, geometrical arrangements, combination: - basic, handshakes, committee, selection of any number of objects, identical and distinct, grouping and distribution, de-arrangements	**6 Hours**
Unit-5:	**Probability** Introduction, Probability based on Dice and Coins, Conditional Probability, Bayes Theorem	**4 Hours**
Reference Books:	• R1:-Arun Shrama:- How to Prepare for Quantitative Aptitude • R2:-Quantitative Aptitude by R.S. Agrawal • R3:-M Tyra: Quicker Maths • R4:-Nishith K Sinha:- Quantitative Aptitude for CAT • R5:-Reference website:- Lofoya.com, gmatclub.com, cracku.in, handakafunda.com, tathagat.mba, Indiabix.com • R6:-Logical Reasoning by Nishith K Sinha • R7:-Verbal and Non Verbal Reasoning by R.S. Agrawal *** Latest editions of all the suggested books are recommended.**	

New Course Added

Course Code: BHM415	B.Sc.(H) Mathematics- Semester-IV **Entrepreneurship**	L-3 T-0 P-0 C-3
Course Outcomes:	**On completion of the course, the students will be:**	
CO1.	**Understanding** the concepts and skills needed to run a business successfully.	
CO2.	**Applying** the steps of project formulation and market research.	
CO3.	**Analyzing** the techno economic feasibility of a project.	
CO4.	**Analyzing** various growth strategies in small scale industry.	
CO5.	**Evaluating** breakeven point, working capital requirements, and taxes.	
Course Content:		
Unit-1:	**Entrepreneurship:** Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.	**8 Hours**
Unit-2:	**Motivation:** Major Motives Influencing an Entrepreneur – Achievement Motivation Training, Self-Rating, Business Games, Thematic Apperception Test – Stress Management, Entrepreneurship Development Programs – Need, Objectives.	**8 Hours**
Unit-3:	**Business:** Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business opportunity, Market Survey and Research, Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.	**8 Hours**
Unit-4:	**Financing and Accounting:** Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working Capital, Costing, Break Even Analysis, Taxation – Income Tax, Excise Duty – Sales Tax.	**8 Hours**
Unit-5:	**Support to Entrepreneurs:** Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures – Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting.	**8 Hours**
Text Book:	1. Khanka. S.S., "Entrepreneurial Development" S. Chand & Co. Ltd., Ram Nagar, New Delhi.	
Reference Books:	1. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill. 2. Mathew J Manimala, "Entrepreneurship theory at cross roads: paradigms and praxis" 2nd Edition Dream tech.	

New Course Added

Course Code: TMUGA-402	Value Added Course B.Sc. (H) - Semester-IV **Advance Algebra and Geometry**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Recognizing the rules of Crypt-arithmetic and relate them to find out the solutions.	
CO2.	Illustrating the different concepts of Height and Distance and Functions.	
CO3.	Employing the concept of higher level reasoning in Clocks, Calendars and Puzzle Problems.	
CO4.	Correlating the various arithmetic and reasoning concepts in checking sufficiency of data.	
Course Content:		
Unit-1:	**Clocks and calendars** Introduction , Angle based , faulty Clock, Interchange of hands, Introduction of Calendars, Leap Year , Ordinary Year	**5 Hours**
Unit-2:	**Set theory** Introduction , Venn Diagrams basics, Venn Diagram – 3 sets, 4-Group Venn Diagrams	**4 Hours**
Unit-3:	**Heights and Distance** Basic concept, Word problems	**3 Hours**
Unit-4:	**Functions** Introduction to Functions, Even and Odd Functions, Recursive	**3 Hours**
Unit-5:	**Problem Solving** Introduction, Puzzle based on 3 variable, Puzzle based on 4 variable	**6 Hours**
Unit-6:	**Data Sufficiency** Introduction, Blood relation based, direction based, ranking based	**5 Hours**
Unit-7:	**Crypt Arithmetic** Introduction of Crypt Arithmetic, Mathematical operations using Crypt Arithmetic, Company Specific Pattern	**4 Hours**
Reference Books:	• R1:-Arun Shrama:- How to Prepare for Quantitative Aptitude • R2:-Quantitative Aptitude by R.S. Agrawal • R3:-M Tyra: Quicker Maths • R4:-Nishith K Sinha:- Quantitative Aptitude for CAT • R5:-Reference website:- Lofoya.com, gmatclub.com, cracku.in, handakafunda.com, tathagat.mba, Indiabix.com • R6:-Logical Reasoning by Nishith K Sinha • R7:-Verbal and Non Verbal Reasoning by R.S. Agrawal *** Latest editions of all the suggested books are recommended.**	

New Course Added

Course Code: TMUGS-401	Value Added Course B.Sc.(H) Mathematics- Semester-IV **Managing Work and Others**	L-2 T-1 P-0 C-0
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	Communicating effectively in a variety of public and interpersonal settings.	
CO2.	Applying concepts of change management for growth and development by understanding inertia of change and mastering the Laws of Change.	
CO3.	Analyzing scenarios, synthesizing alternatives and thinking critically to negotiate, resolve conflicts and develop cordial interpersonal relationships.	
CO4.	Functioning in a team and enabling other people to act while encouraging growth and creating mutual respect and trust.	
CO5.	Handling difficult situations with grace, style, and professionalism.	
Course Content:		
Unit-1:	**Intrapersonal Skills:** Creativity and Innovation Understanding self and others (Johari window) Stress Management Managing Change for competitive success Handling feedback and criticism	**8 Hours**
Unit-2:	**Interpersonal Skills:** Conflict management Development of cordial interpersonal relations at all levels Negotiation Importance of working in teams in modern organisations Manners, etiquette and net etiquette	**12 Hours**
Unit-3:	**Interview Techniques:** Job Seeking Group discussion (GD) Personal Interview	**10 Hours**
Reference Books:	1. Robbins, Stephen P., Judge, Timothy A., Vohra, Neharika, Organizational Behaviour (2018), 18th ed., Pearson Education 2. Burne, Eric, Games People Play (2010), Penguin UK 3. Carnegie, Dale, How to win friends and influence people (2004), RHUK 4. Rathgeber, Holger, Kotter, John, Our Iceberg is melting (2017), Macmillan 5. Steinburg, Scott, Nettiquette Essentials (2013), Lulu.com 6. https://www.hloom.com/resumes/creative-templates/	

New course Added

Course Code: BAS598	B.Sc. (H)-Mathematics- Semester-V **Industrial Training & Presentation**	L-0 T-0 P-6 C-3
Course Procedure:		
	Students will have to undergo industrial training of six weeks in any industry or reputed organization after the II semester examination in summer. The evaluation of this training shall be included in the V semester evaluation. The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the IV semester and shall be the nodal officer for coordination of the training. Students will prepare an exhaustive technical report of the training during the V semester which will be duly signed by the officer under whom training was undertaken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Director/Principal of the college. The student at the end of the V semester will present his report about the training before a committee constituted by the Director/Principal of the College which would comprise of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director/Principal. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Director/Principal. The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned. Not more than three students would form a group for such industrial training/ project submission.	
	The marking shall be as follows.	
Internal: 50 marks	By the Faculty Guide – 25 marks. By Committee appointed by the Director/Principal – 25 marks.	
External: 50 marks	By Officer-in-charge trainee in industry – 25 marks. By External examiner appointed by the University – 25 marks	
	Technical report will consist five chapter as per given format:	
Chapter 1:	Brief about organization	
Chapter 2:	Detail of business carried out by organization	
Chapter 3:	Specific contribution during the industrial training (not more than 500 words)	
Chapter 4:	Learning during the industrial training (not more than 200 words)	
Chapter 5:	Conclusion	

New Course Added

Course Code: BAS531	Discipline Specific Elective Course-I B.Sc.(H) Mathematics- Semester-V **Metric Space**	L-5 T-1 P-0 C-6
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of Euclidean function on R_n.	
CO2.	**Understanding** the definition of continuity for functions from Rn to Rm.	
CO3.	**Applying** the method of convergence for sequences in a metric space.	
CO4.	**Applying** the concepts of compact spaces on the sequences.	
CO5.	**Analyzing** the geometric meaning of each of the metric space properties.	
Course Content:		
Unit-1:	Definition and examples of metric spaces, open spheres and closed spheres, Neighbourhood of a point, Open sets, Interior points, Limit points, Closed sets and closure of a set, Boundary points, diameter of a set, Subspace of a metric space.	**8 Hours**
Unit-2:	Convergent and Cauchy sequences, Complete metric space, Dense subsets and separable spaces, Nowhere dense sets, Continuous functions and their characterizations, Isometry and homeomorphism.	**8 Hours**
Unit-3:	Limit and continuity of a function defined on a metric space, uniform continuity, homeomorphism, Lipschitz continuous function, contraction, isometry, Banach's contraction mapping principle.	**8 Hours**
Unit-4:	Compact spaces, Sequential compactness and Bolzano-Weierstrass property, Finite Intersection property, Continuous functions and compact sets.	**8 Hours**
Unit-5:	Disconnected and connected sets, Components, Continuous functions and connected sets.	**8 Hours**
Text Books:	1. G.F. Simmons: Introduction to Topology and Modern Analysis, McGraw Hill.	
Reference Books:	1. P.K. Jain and Khalil Ahmad: Metric spaces, Second Edition, Narosa Publishing House, New Delhi. 2. B. K. Tyagi, first course in metric spaces, Cambridge University Press. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	https://www.youtube.com/watch?v=ZaJpg5PihYc https://www.youtube.com/watch?v=2z7ONxM139o	

New Course Added

Course Code: BAS532	Discipline Specific Elective Course-I B.Sc.(H) Mathematics- Semester-V **Integral Transform**	L-5 T-1 P-0 C-6
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concepts of different methods of finding Laplace transforms and Fourier transforms of different functions.	
CO2.	**Applying** properties of special functions by their integral representations and symmetries.	
CO3.	**Applying** Fourier series, Bessel's inequality, term by term differentiation and integration of Fourier series.	
CO4.	**Applying** the knowledge of L.T, F.T, and Finite Fourier transforms in finding the solutions of differential equations, initial value problems and boundary value problems.	
CO5.	**Analyzing** Parseval's identity, Plancherel's theorem and applications of Fourier transforms to boundary value problems.	
Course Content:		
Unit-1:	**FOURIER SERIES:** Fourier Series, Theorems, Dirichlet's conditions, Fourier Series for even and odd functions, Half range Fourier series, Other forms of Fourier series	**8 Hours**
Unit-2:	**LAPLACE TRANSFORM:** Definition of Laplace Transform, Linearity property, Piecewise continuous function, Existence of Laplace transform, Functions of exponential order and of class A, First and second shifting theorems of Laplace Transform, Change of scale property, Laplace Transform of derivatives, Initial value problems, Laplace Transform of Integrals, Laplace Transform of Multiplication by T, Laplace Transform of Divison by t, Laplace Transform of periodic functions and error function.	**8 Hours**
Unit-3:	**INVERSE LAPLACE TRANSFORM:** Definition of Inverse Laplace Transform, Linearity property, First and second shifting theorems of Inverse Laplace Transform, Change of scale property, Division by p, Convolution theorem, Heaviside's expansion formula(with proofs and applications).	**8 Hours**
Unit-4:	**FOURIER TRANSFORMS:** FOURIER TRANSFORMS, Dirichlet's conditions, Fourier integral formula (without proof), Fourier transform, Inverse Theorem for Fourier Transform, Fourier Sine and Cosine transforms and their inversion formula, Linearity property of Fourier transforms, Change of Scale property, Shifting theorem, Modulation theorem, Convolution theorem of Fourier transforms.	**8 Hours**
Unit-5:	**APPLICATIONS OF LAPLACE TRANSFORMS:** Solution of Ordinary Differential Equations with constant and variable coefficients, Solution of Simultaneous Ordinary Differential Equations, Solution of Partial Differential Equations, and Application of Fourier transforms to initial and boundary value problems.	**8 Hours**

New course Added

Course Code: BAS535	Discipline Specific Elective Course-II B.Sc.(H) Mathematics- Semester-V **Dynamics**	L-5 T-1 P-0 C-6
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the Projectile, impulse, impact and laws of impact.	
CO2.	**Understanding** of the principles of dynamics.	
CO3.	**Analyzing** the dynamics of rigid body.	
CO4.	**Analyzing** the path of a projectile is a parabola.	
CO5.	**Evaluating** the Composition of Simple Harmonic Motion and the differential equation of a central orbit.	
Course Content:		
Unit-1:	**Kinematics in two dimensions**: Velocity, Acceleration, Angular velocity and Relation between Angular velocity and linear velocity, Radial and Transversal velocity and acceleration, Tangential and Normal velocity and acceleration.	**8 Hours**
Unit-2:	**Rectilinear motion:** Motion in a straight line with constant acceleration, Newton's Laws of motion, Simple Harmonic motion, Motion under inverse square law, Motion of the particle under the attraction of the earth, Hook's Law, Horizontal and Vertical elastic String.	**8 Hours**
Unit-3:	**Constrained motion:** Motion of a particle on a smooth and rough vertical plane curve under gravity, Motion along the inside of a vertical circle, Motion after the leaving the circle, Simple Pendulum, Cycloidal Pendulum, Motion along a smooth cycloid.	**8 Hours**
Unit-4:	**Central Forces and Orbit:** Definition of Central force and central orbit, Differential equation of central orbit (Polar and Pedal form), Apse, velocity in a circle, velocity at Infinity, Kepler's laws of planetary motion, and their deductions.	**8 Hours**
Unit-5:	**Moments and Product of Inertia:** Moment of Inertia and Product of Inertia of bodies, Definition of Principle axes, Theorem on parallel axes, theorem of six constant of body, Momental ellipse, Momental ellipsoid, and equimomental system, Motion of rigid body, Effective force, Definition and properties of D'alembert's principle, General Equation of a motion of bodies.	**8 Hours**
Text Books:	1. "A Text book on Dynamics" by S.S. Seth, G.C. Chaddha, Student's Friends & Company.	
Reference Books:	1. "Dynamics" by M. Ray and G. C. Sharma, S. Chand & Company. 2. "Dynamics" by P. K. Mittal and P. K. Shukla, S.J. Prakashan 3. "Dynamics of Rigid body" by M. Ray & G. C. Sharma; Student's Friends & Company. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	https://www.youtube.com/watch?v=ZwuwzE1qAj4 https://www.youtube.com/watch?v=BSvSkSV8Jz8	

New Course Added

Course Code: BAS536	**Discipline Specific Elective Course-II** **B.Sc.(H) Mathematics- Semester-V** **Special Functions**	**L-5** **T-1** **P-0** **C-6**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** special functions of various engineering problem and to known the application of some basic mathematical methods via all these special functions.	
CO2.	**Understanding** the applications and the usefulness of these special functions.	
CO3.	**Understanding** of recurrence formula of the various functions.	
CO4.	**Applying** the functions of different types of differential equations.	
CO5.	**Analyzing** the special function of Legendre & Bessel function.	
Course Content:		
Unit-1:	Preliminaries, Gamma function and related functions, Gauss multiplication theorem, the hyper geometric differential equation, Gauss hyper geometric function.	**8 Hours**
Unit-2:	Integral representation of hyper geometric function, Evaluation of hyper geometric function, the confluent hyper geometric differential equation, Confluent hyper geometric function.	**8 Hours**
Unit-3:	Bessel's equation, solution of Bessel's equation, Bessel's functions $J_n(x)$, Recurrence Formulae, Equations reducible to Bessel's equation, orthogonality of Bessel's Functions, A generating function for $J_n(x)$, Basic properties.	**8 Hours**
Unit-4:	Legendre's equation, Legendre's polynomial $P_n(x)$, Legendre's function of the second kind $Q_n(x)$, General solution of Legendre's equation, Rodrigue's formula, Legendre polynomials, A generating function of Legendre's polynomial , Orthogonality of Legendre polynomials, Recurrence formulae for $P_n(x)$.	**8 Hours**
Unit-5:	Hermite's equation and its solution, Hermite polynomial of order n, Generating function, orthogonal property, Recurrence relations	**8 Hours**
Text & Reference Books:	1. W.W. Bell: Special Function for Scientists and Engineers, Dever publications. 2. U.P. Singh: Special Function &Their application, Wisdom Press. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	https://www.youtube.com/watch?v=q-crw2sq4eM&list=PL5Xv9SnZb7Hf3uRZA_sOfFN8ZKGYaBEgo https://www.youtube.com/watch?v=MGLgDIE_uaU	

New Course Added

Course Code: BAS631	Discipline Specific Elective Course-III B.Sc.(H) Mathematics- Semester-VI **Mathematical Modeling**	L-5 T-1 P-0 C-6
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the various mathematical models.	
CO2.	**Understanding** the basic properties of graphs.	
CO3.	**Understanding** the concepts of vector & vector spaces.	
CO4.	**Analyzing** the analytic and numerical models.	
CO5.	**Analyzing** the value of model results discussed in various sources and in scientific and mathematical literature.	
Course Content:		
Unit-1:	Definition of Graph and their properties, types of graph, homomorphism, isomorphism, automorphism of graph, subgraph, Walk, trail and path, connected and disconnected graph Eular's Graph, Operation on graph.	8 Hours
Unit-2:	Definition of Trees, Pendent vertex, center of a tree, binary tree, spaning tree, Fundamental Circuits, Connectivity and separability, preorder and post order.	8 Hours
Unit-3:	Planar and dual graphs, Kuratowski's two graphs, different representations of planer graphs, detection of planarity, Geometric dual, Combinatorial dual, Thickness and Crossing.	8 Hours
Unit-4:	Vectors and vector spaces, Vector space associated with a graph, Basis vectors of a graph, circuit and cut-set subspace, Orthogonal vectors and spaces, Intersection and join of W and W_x.	8 Hours
Unit-5:	Matrix representation of graphs, Incidence matrix, Sub matrix of $A(G)$, Circuit matrix, Fundamental circuit matrix and Rank of B , Cut-set matrix, Path matrix, Adjacency Matrix.	8 Hours
Text Books:	1. "Graph Theory" by Narsingh Deo, Printice Hall of India	
Reference Books:	1. "Graph Theory" by S.B. Singh, Khanna book Publishing co. ***Latest editions of all the suggested books are recommended**	
Additional electronics reference material:	https://www.youtube.com/watch?v=br7tS1t2SFE https://www.youtube.com/watch?v=1h2BoCtobXw	

New Course Added

Course Code: BAS632	**Discipline Specific Elective Course-III** **B.Sc.(H) Mathematics- Semester-VI** **Theory of Probability**	**L-5** **T-1** **P-0** **C-6**
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** the concept of the probability, addition law of probability and multiplication law of probability with its applications.	
CO2.	**Applying** the concept of discrete and continuous random variable to calculate the moment and generating functions.	
CO3.	**Analyzing** the concept of mathematical expectation, addition and multiplication theorem of Expectation.	
CO4.	**Analyzing** the M.G.F, C.F and P.D.F of the discrete and continuous distributions.	
CO5.	**Evaluating** the concept of Probability distributions and its recurrence relation of the distribution.	
Course Content:		
Unit-1:	Probability: Introduction, sample space, events and algebra of events, Kinds of Probability: classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events.	**8 Hours**
Unit-2:	Random Variables: Discrete and continuous random variables, p.m.f, p.d.f, c.d.f. Illustrations of random variables and its properties, variance, moments and moment generating function.	**8 Hours**
Unit-3:	Mathematical Expectation- Expectation of a Random Variable, Addition & Multiplication Theorem of Expectation, Moments-Moment Generating Function, Limitations of m.g.f, cumulants - additive property.	**8 Hours**
Unit-4:	Discrete probability distributions: Bernoulli distribution : M.G.F, C.F , mean and variance, Binomial distribution : M.G.F, C.F , P,D.F, mean and variance, Poisson distribution: M.G.F, C.F , P,D.F, mean and variance.	**8 Hours**
Unit-5:	Continuous Probability Distributions: Gamma Distribution : M.G.F, C.F , P,D.F, mean and variance, Beta distribution: M.G.F, C.F , P,D.F, mean and variance, and Uniform distribution: M.G.F, C.F , P,D.F, mean and variance.	**8 Hours**
Text Books:	1. Mathematical Statistics" by S.C. Gupta, S. Chand & co.	
Reference Books:	1. Miller, Irwin and Miller, Marylees : John E. Freund's Mathematical Statistics with Applications, Pearson Education, Asia. 2. Myer, P.L.: Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi. ***Latest editions of all the suggested books are recommended**	
Additional electronics reference material:	**https://www.youtube.com/watch?v=SkV6ptyG_Jg** **https://www.youtube.com/watch?v=H2Ji-Q4MfqU**	

Post Revision

Course Code: TMUGE101	B.Sc. (H) Physics- Semester-I English Communication – I	L-2 T-0 P-2 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering and understanding** of the basic of English grammar and vocabulary.	
CO2.	**Understanding** of the basic Communication process.	
CO3.	**Applying** correct vocabulary and tenses in sentences construction.	
CO4.	**Analyzing** communication needs and developing communication strategies using both verbal & non-verbal method.	
CO5.	**Drafting** applications in correct format for common issues.	
CO6.	**Developing** self-confidence.	
Course Content:		
Unit-1:	**Introductory Sessions** • Self-Introduction • Building Self Confidence: Identifying strengths and weakness, reasons Failure, strategies to overcome Fear of Failure • Importance of English Language in present scenario (Practice: Self-introduction session)	6 Hours
Unit-2:	**Basics of Grammar** • Parts of Speech • Tense • Subject and Predicate • Vocabulary: Synonym and Antonym (Practice: Conversation Practice)	12 Hours
Unit-3:	**Basics of Communication** • Communication: Process, Types, 7Cs of Communication, Importance & Barrier • Language as a tool of communication • Non-verbal communication: Body Language • Etiquette & Manners • Basic Problem Sounds (Practice: Pronunciation drill and building positive body language)	10 Hours
Unit-4:	**Application writing** • Format & Style of Application Writing • Practice of Application writing on common issues.	8 Hours
Unit-5:	**Value based text reading:** Short Story (Non- detailed study) • Gift of Magi - O. Henry	4 Hours
Text Book:	1. Singh R.P., An Anthology of Short stories, O.U.P. New Delhi.	
Reference Books:	1. Kumar, Sanjay. & Pushp Lata. "Communication Skills" New Delhi: Oxford University Press.	

Pre Revision

Semester I

English Communication and Soft Skills – I

[BHM199/EHM199 amended vide approval dt. July 23, 2018 of V.C]

Course Code: BHM199/EHM199

L	T	P	C
1	1	2	2

Objectives:

1. To remove the phobia of conversing in English.
2. To make the learners enable to express themselves among peers & teachers.
3. To enable students, improve their vocabulary.
4. To introduce them with basic communicative skills in real life situations

Course Outcomes: At the end of the semester, the learner will be able to

1. Remove fear of speaking in English among peers & teachers.
2. Develop the ability to speak in English (even if grammatically not perfect).
3. Use vocabulary taught for speaking and writing simple sentence for day to day conversation.
4. Use taught vocabulary for writing applications on common issues.

Course Contents:

Unit – I Fear of Failure, Reasons of Fear of Failure & How to overcome it (12 hours)

- Self-Introduction
- Identifying strengths and weakness
- Fear of Failure: Signs of Fear of Failure, Reasons of Fear of Failure, Strategies to overcome Fear of Failure
- Positive Attitude
- Motivation
- Building Self Confidence

Unit – II Confidence, Presentability, Etiquettes & Manners (10 hours)

- Body Language: Facial Expression, Eye Contact, Gesture, Posture, Tips to have appropriate body language
- Grooming & Dressing Sense
- Etiquette & Manners: Social Etiquettes, Telephonic Etiquettes, Dining Etiquettes, Etiquettes to handle cultural differences, Etiquettes of Effective Conversation.
- Problem Sounds (s-sh,j-z,v-b)

Unit – III Conversation Practice, commonly made mistake & Initiating a conversation (10 hours)

- Vocabulary of commonly used words (50 Words)
- Conversation Practice: At College, At Bank, At Ticket Counter (Railway Station & Movie Theatre)
- How to initiate a conversation
- Commonly made mistakes in conversation
- Basic of Communication: 7Cs of Communication

Unit – IV Application writing (08 hours)

- Format & Style of Application Writing
- Practice of Application writing on common issues.

Registrar

Past Revision

Course Code: TMUGE201	B.Sc.(H) Physics- Semester-II **English Communication – II**	L-2 T-0 P-2 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering & understanding** the basics of English Grammar and Vocabulary.	
CO2.	**Understanding** the basics of Listening, Speaking & Writing Skills.	
CO3.	**Understanding** principles of letter drafting and various types of formats.	
CO4.	**Applying** correct vocabulary and grammar in sentence construction while writing and delivering presentations.	
CO5.	**Analyzing** different types of listening, role of Audience & Locale in presentation.	
CO6.	**Drafting** Official Letters, E-Mail & Paragraphs in correct format.	
Course Content:		
Unit-1:	**Functional Grammar** **(10 hours)** • Prefix, suffix and One words substitution • Modals • Concord	**10 Hours**
Unit-2:	**Listening Skills** • Difference between listening & hearing, Process and Types of Listening • Importance and Barriers to listening	**04Hours**
Unit-3:	**Writing Skills** **(12 hours)** • Official letter and email writing • Essentials of a paragraph, • Developing a paragraph: Structure and methods Paragraph writing (100-120 words)	**12 Hours**
Unit-4:	**Strategies & Structure of Oral Presentation** **(08 hours)** • Purpose, Organizing content, Audience & Locale, Audio-visual aids, Body langauge • Voice dynamics: Five P's - Pace, Power, Pronunciation, Pause, and Pitch. • Modes of speech delivery and 5 W's of presentation	**8 Hours**
Unit-5:	**Value based text reading:** Short Essay (Non- detailed study) **(06 hours)** How should one Read a book? - Virginia Woolf	**6 Hours**
Text Book:	**1.** Singh R.P., An Anthology of English Essay, O.U.P. New Delhi	

Pre Revision

Semester II

English Communication and Soft Skills-II

[BHM249/EHM249 amended vide approval dt. July 23, 2018 of V.C]

Course Code: BHM249/EHM249

L	T	P	C
1	1	2	2

Objectives:

1. To enhance the vocabulary of learners to address competitive exams like GATE
2. To develop ability of sentence construction.
3. To enhance learner's writing ability.
4. To make the learner effective in presenting himself/herself.

Course Outcomes: At the end of the semester, the learner will be able to

1. Learn additional 50 words apart from 50 words learnt in preceding semester (Two words/lecture)
2. Write letters effectively.
3. Acquire competence in constructing short sentences dealing day to day activities with grammatical accuracy.
4. Express themselves before class / in a group and attain proficiency in deliverance.
5. Acquire adequate knowledge of grammar to address competitive exams like GATE

Course Contents:

Unit – I Vocabulary & Grammar **(14 hours)**

- Homophones, Homonyms, Synonyms, Antonyms and One-word substitution.
- Parts of Speech, Modals, Tenses and Simple sentence construction.

Unit – II Listening Skills **(05 hours)**

- Difference between listening & hearing, Types of Listening, Process
- Importance and Barriers to listening

Unit – III Writing Skills **(08 hours)**

- Letters and Email writing
- Story Narration

Unit – IV Strategies & Structure of Presentation and Problem Sounds **(13 hours)**

- Managing Time, Audience & Locale, Structure and Organization of Content and 5 W's
- Problem Sounds: S- Sh, J-Z and V-B

Reference Books:

1. Nesfield J.C. "*English Grammar Composition & Usage*" Macmillan Publishers
2. Sood Madan "*The Business letters*" Goodwill Publishing House, New Delhi
3. Kumar Sanjay &Pushplata "*Communication Skills*" Oxford University Press, New Delhi.

Registrar

Post Revision

Course Code: TMUGE301	B.Sc.(H) Chemistry- Semester-III **English Communication- III**	L-2 T-0 P-2 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** knowledge of grammar to face competitive exams.	
CO2.	**Understanding** advance English language by using variety of words i.e. idioms and phrase in variety of sentences in functional context.	
CO3.	**Understanding** listening for effective communication.	
CO4.	**Applying** their English grammar knowledge in day to day context.	
CO5.	**Applying** writing and comprehensive skills in English.	
CO6.	**Analyzing** Comprehending & enriching their vocabulary through prescribed text.	
Course Content:		
Unit-1:	English Grammar & Vocabulary **(a)** Correction of Common Errors (with recap of English Grammar with its usage in practical context.) **(b)** Synthesis: Simple, complex and compound sentence **(c)** Commonly used Idioms & phrases (Progressive learning whole semester)	**14 Hours**
Unit-2:	Speaking Skills **(a)** Art of public speaking **(b)** Common conversation **(c)** Extempore **(d)** Power Point Presentation (PPt) Skills: Nuances of presenting PPTs	**10 Hours**
Unit-3:	Comprehension Skills **(a)** Strategies of Reading comprehension: Four S's **(b)** How to solve a Comprehension (Short unseen passage: 150-200 words)	**6 Hours**
Unit-4:	Professional Writing **(a)** Preparing Notice, Agenda & Minutes of the Meeting	**7 Hours**
Unit-5:	Value based text reading: Short story **(a)** The Barber's Trade Union - Mulk Raj Anand	**3 Hours**
Text Book:	**(d)** Singh R.P., An Anthology of English Essay, O.U.P. New Delhi	
Reference Books:	1. Wren & Martin *"High School English Grammar and Composition"* S.Chand & Co.Ltd., New Delhi. 2. Kumar Sanjay & Pushplata *"Communication Skills"* Oxford University Press, New Delhi. 3. Agrawal, Malti *"Professional Communication"* Krishana Prakashan Media (P) Ltd. Meerut. ***Latest editions of all the suggested books are recommended.**	
Additional Electronics Reference Material	1- https://www.youtube.com/watch?v=dpYltVtsS_Q 2- https://www.youtube.com/watch?v=Z8HttKW8jVE 3- https://www.youtube.com/watch?v=srn5jgr9TZo	

Pre Revision

Semester-III

English Communication and Soft Skills-III

[BHM349/EHM349/449 amended vide approval dt. July 23, 2018 & January 23, 2019 of V.C]

Course Code: BHM349/EHM349/449

L	T	P	C
1	1	2	2

Objectives:

1. To enable the learners to upgrade their knowledge of grammar and vocabulary to address competitive exams like GATE.
2. To enable the learner to improve their listening.
3. To enable the learners to improvise their voice modulation in reading and speaking.
4. To enable the learners to enhance their writing and comprehensive skills in English
5. To enable the learners to proactively participate in activities in situational context.

Course Outcomes: At the end of the semester, the learners will be able to

1. Refine their usage of English grammar in day to day context.
2. Acquire adequate knowledge of grammar to address competitive exams like GATE.
3. Use advance English language by using variety of words i.e. idioms and phrase in variety of sentences in functional context.
4. Improve their listening to understand the basic content.
5. Improvise their voice modulation while reading and speaking something.
6. Enhance writing and comprehensive skills in English.
7. Present simple Power Point Presentation (PPt).
8. Proactively participate in activities in situational context (like impromptu).

Course Contents:

Unit – I Grammar & Vocabulary **(14 hours)**

- Correction of Common Errors (with recap of English Grammar with its usage in practical context.)
- Transformation of sentences
- Commonly used Idiom & Phrases (Progressive learning whole semester)

Unit – II Essence of Effective listening & speaking **(12 hours)**

- Listening short conversation/ recording (TED talks / Speeches by eminent personalities) *Critical Review of these abovementioned*
- Voice Modulation: Five P's - Pace, Power, Pronunciation, Pause, and Pitch.
- Impromptu
- Power Point Presentation (PPt) Skills: Nuances of presenting PPTs

Unit – III Reading and Comprehension Skills **(08 hours)**

- Strategies of Reading comprehension: Four S's
- How to solve a Comprehension (Short unseen passage: 150-200 words)
- Reading Newspaper (Progressive learning whole semester)

Unit – IV Writing Skills **(06 hours)**

- Essentials of a paragraph
- Paragraph writing (100-120 words)

Reference Books:

1. Allen, W. *"Living English Structure"* Pearson Education, New Delhi.

Registrar

Post Revision

Course Code TMUGE401	B.Sc.(H) Physics- Semester-IV **English Communication – IV**	L-2 T-0 P-2 C-3
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Remembering** adequate knowledge of grammar and vocabulary through prescribed text to address competitive exams.	
CO2.	**Understanding** the value of listening to understand the basic content.	
CO3.	**Understanding** the usage of English grammar in day to day context.	
CO4.	**Understating** about the skills required in corporate world.	
CO5.	**Applying** writing and comprehensive skills in English.	
CO6.	**Creating** a simple proposal and report.	
Course Content:		
Unit-1:	**Vocabulary & Grammar** • Homophones and Homonyms • Correction of Common Errors (with recap of English Grammar with its usage in practical context.) • Transformation of sentences	**12 Hours**
Unit-2:	**Essence of Effective listening & speaking** • Listening short conversation/ recording (TED talks / Speeches by eminent personalities) *Critical Review of these abovementioned* • Impromptu	**5 Hours**
Unit-3:	**Professional Writing** • Proposal: Significance, Types, Structure & AIDA • Report Writing: Significance, Types, Structure& Steps towards Report writing	**8 Hours**
Unit-4:	**Job Oriented Skills** • Cover Letter • Preparing Resume and Curriculum-Vitae • Interview: Types of Interview, Tips for preparing for Interview and Mock Interview • Corporate Expectation & Professional ethics: Skills expected in corporate world.	**10 Hours**
Unit-5:	**Value based text reading:** Short story • A Bookish Topic - R.K. Narayan	**5 Hours**
Text Book:	**1.** Singh R.P., An Anthology of English Essay, O.U.P. New Delhi	
Reference Books:	**1.** Joseph, Dr C.J. & Myall E.G. "A *Comprehensive Grammar of Current English*" Inter University Press, Delhi **2.** Chaudhary Sarla "Basic Concept of Professional Communication" Dhanpat Rai Publication, New Delhi. **3.** Kumar Sanjay &Pushplata "Communication Skills" Oxford University Press, New Delhi. ***Latest editions of all the suggested books are recommended.**	
Additional Electronics Reference Material	1- https://www.youtube.com/watch?v=dpYltVtsS_Q 2 - https://www.youtube.com/watch?v=QthdqIB0WS8 3 - https://www.youtube.com/watch?v=MrgHfK8Pcfk 4 - https://www.youtube.com/watch?v=860LtRxP3rw	

Pre Revision

Semester IV

English Communication and Soft Skills – IV

[BHM499/EHM599/699 amended vide approval dt. July 23, 2018 of V.C]

Course Code: BHM499/EHM599/699

L	T	P	C
1	1	2	2

Objectives:

1. To enable the learners to inculcate the skills of technical writing.
2. To enable the learners to proactively participate in Job Oriented activities.
3. To enable the learners to be aware of corporate Skills.

Course Outcomes: At the end of the semester, the learners will be able to

1. Formulate their CVs along with cover letter in Job oriented perspective.
2. Communicate technically in functional context.
3. Proactively participate in Job Oriented activities. (Like Interview, GD etc.)
4. Aware of the skills required in corporate world.

Course Contents:

Unit – I: Job Oriented Skills **(10 Hours)**

- Cover Letter
- Preparing Resume and Curriculum-Vitae
- Writing Joining Report

Unit – II: Technical Communication **(12 Hours)**

- Technical description of engineering objects
- Data Interpretation: Tables, Charts, & Graphs
- Preparing Agenda & Minutes of the Meeting
- Technical Proposal: Types, Significance, Structure & AIDA
- Report Writing: Types, Structure& Steps towards Report writing

Unit- III: Interview Skills **(10 Hours)**

- Branding yourself
- Interview: Types of Interview, Tips for preparing for Interview and Mock Interview
- Group Discussion: Do's and Don'ts of Group Discussion
- Negotiation skills

Unit – IV: Corporate Skills **(8 Hours)**

- Corporate Expectation
- Service mindset: Selling a product - Ad made shows
- Goal setting
- Team Building & Leadership
- Professional Ethics

Reference Books:

- Raman Meenakshi & Sharma Sangeeta, *"Technical Communication-Principles & Practice"* Oxford University Press, New Delhi.
- Mohan K. & Sharma R.C., "*Business Correspondence of Report Writing*", TMH, New Delhi.
- Chaudhary, Sarla "Basic Concept of Professional Communication" Dhanpat Rai Publication, New Delhi.
- Kumar Sanjay & Pushplata "*Communication Skills*" Oxford University Press, New Delhi.
- Agrawal, Malti "*Professional Communication*" Krishana Prakashan Media (P) Ltd. Meerut.

Registrar

Post Revision

Course Code: BAS319	B.Sc.(H) Mathematics- Semester-III **Numerical Analysis**	L-5 T-1 P-0 C-6
Course Outcomes:	**On completion of the course, the students will be :**	
CO1.	**Understanding** finite differences and interpolation with equal intervals and Unequal Intervals.	
CO2.	**Understanding** introduction of operators and its properties.	
CO3.	**Applying** numerical solution of first order differential equation using Eulers, Picards and Runge Kutta methods and derivative using forward and backward difference interpolation.	
CO4.	**Analyzing** Lagrange's interpolation formula for unequal intervals.	
CO5.	**Evaluating** Numerical differentiation and Integration, Trapezoidal Formulae, Simpson's Rule, Weddle rule and Cote's formula.	
Course Content:		
Unit-1:	Introduction of finite differences; Forward and backward differences, Forward and backward differences table, Missing term problems, General Introduction of operators and its properties.	**8 Hours**
Unit-2:	Interpolation with equal intervals and Unequal Intervals; Newton Gregory Forward and Backward Formula, Divided difference table, Newton's divide difference Formula, Lagrange's Interpolation Formula, Hermit Interpolation formulas using differences.	**8 Hours**
Unit-3:	Central difference formulae, Bessel's and Strling formula, Gauss Forward and Backward, Evertt formula.	**8 Hours**
Unit-4:	Numerical differentiation and Integration, Derivative using forward and backward difference interpolation formula, Trapezoidal Rule, Simposon's one-third and three-eight rules, Weddle rule and Cotes formula.	**8 Hours**
Unit-5:	Numerical solution of first order differential equation using Eulers, Picards and Runge Kutta methods.	**8 Hours**
Text Books:	1. Numerical analysis", by Burden, Cengage Learning.	
Reference Books:	**1.** "Numerical Analysis" by P.P. Gupta and Sanjay Gupta, Krishana Prakashan Mandir. **2.** "Numerical Analysis" by S.S. Sastry, Prentice Hall of India. **3.** "Introduction to Numerical Analysis" by C. E. Froberg, Addition Welly Publishing Co. ***Latest editions of all the suggested books are recommended.**	
Additional electronics reference material:	1. https://www.youtube.com/watch?v=6x_5R9zggIw 2. https://www.youtube.com/watch?v=PBjGdQOghJE 3. https://www.youtube.com/watch?v=G7p0nvtUFn0	

Pre Revision

Semester-V
Numerical Analysis

Course Code: BAS516

L	T	P	C
4	1	0	5

Course Contents:

Unit I **(Lectures 08)**

Calculus of finite differences, Finite differences and difference formulae operators E, properties and relation between operators, difference table, Factorial Notation.

Unit II **(Lectures 08)**

Interpolation with equal intervals and Unequal Intervals; Newton Gregory Forward and Backward Formula, Newton's divide difference Formula, Lagrange's Interpolation Formula, Hermit Interpolation formulas using differences. Different interpolation methods, curve fittings use of calculus of finite difference, divided difference. Newton's formula of unequal intervals, Lagranges interpolation formula for unequal intervals. Iterative Methods

Unit III **(Lectures 06)**

Central difference formulae, Gaussian formula Bessel's and Strling formula, Gauss Evertt formula

Unit IV **(Lectures 08)**

Numerical differentiation and Integration, derivative using forward and backward difference interpolation formula, Trapezoidal Formulae, Simposon's Formula, Cotes formula.

Unit V **(Lectures 10)**

Numerical solution of first order differential equation using Kutta & Runge Kutta method and solution of algebraic and Transcedental Equations using Newton Raphson method & Graff's squaring method.

Text Books:

1. Numerical analysis", by Burden, Cengage Learning.
2. "Numerical Analysis" by B. S. Grewal, Khanna Publishing.
3. "Numerical Analysis" by Pradeep Niyosi, Tata Mcgraw Hell.

Reference Books:

1. "Numerical Analysis" by P.P. Gupta and Sanjay Gupta, Krishana Prakashan Mandir
2. "Numerical Analysis" by S.S. Sastry, Prentice Hall of India.
3. "Introduction to Numerical Analysis" by C. E. Froberg, Addition –Welly Publishing Co.

*** Latest editions of all the suggested books are recommended.**

Registrar