



# BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(Autonomous Institution Affiliated to VTU, Belagavi)

**Scheme of Teaching and Examinations-2022**

Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023 - 24)

I Semester (CSE Stream)			Dept ISE					Chemistry Cycle					
Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	*ASC(IC)	<b>BMATS101</b>	Mathematics -I for CSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	<b>BCHE102</b>	Applied Chemistry for CSE Stream	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	<b>BCEDK103</b>	Computer-Aided Engineering Drawing	Civil/Mech Engg dept	2	0	2	0	03	50	50	100	03
4	ESC-I	<b>BESCK104C</b>	Introduction to Electronics Communication	Respective Engg Dept	3	0	0	0	03	50	50	100	03
5	PLC-I	<b>BPLCK105B</b>	Introduction to Python Programming	Any Dept	2	0	2	0	03	50	50	100	03
6	AEC	<b>BENGK106</b>	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMS	<b>BICOK107</b>	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
8	HSMS	<b>BSFHK158</b>	Scientific Foundations of Health	Any Dept	1	0	0	0	01	50	50	100	01
<b>TOTAL</b>					<b>14</b>	<b>4</b>	<b>8</b>	<b>0</b>	<b>18</b>	<b>400</b>	<b>400</b>	<b>800</b>	<b>20</b>

**SDA**-Skill Development Activities, **TD/PSB**- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**- Ability Enhancement Course, **HSMS**-Humanity and Social Science and management Course, **SDC**- Skill Development Course, **CIE** -Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

**\*-BMATS101** Shall have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers. **\*\* The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**

**#-BCHES102-** SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination

**ESC or ETC of 03 credits Courses** shall have only a theory component (L:T:P:S=3:0:0:0) or if the nature the of course required experimental learning syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0 ),

**All 01 Credit-** courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

**Credit Definition:**

1- hour Lecture **(L)** per week=**1Credit**

2-hours Tutorial**(T)** per week=**1Credit**

2- hours Practical / Drawing **(P)** per week=**1Credit**

2-hous Skill Development Actives **(SDA)** per week = **1 Credit**

04-Credits courses are to be designed for 50 hours of Teaching-Learning Session

04-Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions

03-Credits courses are to be designed for 40 hours of Teaching-Learning Session

02- Credits courses are to be designed for 25 hours of Teaching-Learning Session

01-Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

**Student's Induction Program:** Motivating (Inspiring) Activities under the Induction program – The main aim of the induction program is to provide newly admitted students a broad understanding of society, relationships, and values. Along with the knowledge and skill of his/her study, students' character needs to be nurtured as an essential quality by which he/she would understand and fulfill the responsibility as an engineer. The following activities are to be covered in 21 days. Physical Activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to Local areas, Familiarization with Department/Branch and Innovation, etc. For details, refer the ANNEXURE-I of Induction Programs notification of the University published at the beginning of the 1<sup>st</sup> semester.

**AICTE Activity Points** to be earned by students admitted to BE/ B.Tech., / B. Plan day college program (For more details refer to Chapter 6, AICTE Activity Point Program, Model Internship Guidelines): Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4 years Degree programs through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Program. Students transferred from other Universities to the fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card. The activities can be spread over the years, any time during the semester weekends, and holidays, as per the liking and convenience of the student from the year of entry to the program. However, the minimum hours' requirement should be fulfilled. Activity Points (non-credit) do not affect SGPA/CGPA and shall not be considered for vertical progression. In case students fail to earn the prescribed activity Points, an Eighth Semester Grade Card shall be issued only after earning the required activity points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

<b>(ESC-I) Engineering Science Courses-I</b>					<b>(ETC-I) Emerging Technology Courses-I</b>				
<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>BESCK104A</b>	Introduction to Civil Engineering	3	0	0	<b>BETCK105A</b>	Smart Materials and Systems	3	0	0
<b>BESCK104B</b>	Introduction to Electrical Engineering	3	0	0	<b>BETCK105B</b>	Green Buildings	3	0	0
<b>BESCK104C</b>	Introduction to Electronics Communication	3	0	0	<b>BETCK105C</b>	Introduction to Nano Technology	3	0	0
<b>BESCK104D</b>	Introduction to Mechanical Engineering	3	0	0	<b>BETCK105D</b>	Introduction to Sustainable Engineering	3	0	0
<b>BESCK104E</b>	Introduction to C Programming	2	0	2	<b>BETCK105E</b>	Renewable Energy Sources	3	0	0
					<b>BETCK105F</b>	Waste Management	3	0	0
					<b>BETCK105G</b>	Emerging Applications of Biosensors	3	0	0
					<b>BETCK105H</b>	Introduction to Internet of Things (IOT)	3	0	0
					<b>BETCK105I</b>	Introduction to Cyber Security	3	0	0
					<b>BETCK105J</b>	Introduction to Embedded System	3	0	0
<b>(PLC-I) Programming Language Courses-I</b>									
<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>					
<b>BPLCK105A</b>	Introduction to Web Programming	2	0	2					
<b>BPLCK105B</b>	Introduction to Python Programming	2	0	2					
<b>BPLCK105C</b>	Basics of JAVA programming	2	0	2					
<b>BPLCK105D</b>	Introduction to C++ Programming	2	0	2					
<b>The course BESCK104E/BESCK204E, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by ANY DEPARTMENT</b>									

- The student has to select one course from the ESC-I group.
- CSE/ISE & allied branch students shall opt for any one of the courses from the ESC-I group **except**, BESCK104E-**Introduction to C Programming**
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-I or PLC-I group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa



## BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(Autonomous Institution Affiliated to VTU, Belagavi)

**Scheme of Teaching and Examinations-2022**

Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023 - 24)

II Semester (CSE Stream)			Dept ISE				Physics Cycle						
Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	*ASC(IC)	<b>BMATS201</b>	Mathematics -II for CSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	<b>BPHYS202</b>	Applied Physics for CSE Stream	Physics	2	2	2	0	03	50	50	100	04
3	ESC	<b>BPOPS203</b>	Principles of Programming Using C	CSE	2	0	2	0	03	50	50	100	03
4	ESC-II	<b>BESCK204D</b>	Introduction to Mechanical Engineering	Respective Engg Dept	3	0	0	0	03	50	50	100	03
5	ETC-II	<b>BETCK205H</b>	Introduction to Internet of Things (IoT)	Any Dept	3	0	0	0	03	50	50	100	03
6	AEC	<b>BPWSK206</b>	Professional Writing Skills in English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMC	<b>BKSKK207/ BKBBK207</b>	Sanskrutika Kannada/ Balake Kannada	Humanities	1	0	0	0	01	50	50	100	01
8	AEC/SDC	<b>BIDTK258</b>	Innovation and Design Thinking	Any Dept	0	2	0	0	02	50	50	100	01
9	MC	<b>BSLK108</b>	Skill Lab	Any Dept			3		--	100	--	--	00
<b>TOTAL</b>					<b>14</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>19</b>	<b>400</b>	<b>400</b>	<b>800</b>	<b>20</b>

**SDA**-Skill Development Activities, **TD/PSB**- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**- Ability Enhancement Course, **HSMS**-Humanity and Social Science and management Course, **SDC**- Skill Development Course, **CIE**-Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

\*-**BMATS201** Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers. **\*\* The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**  
 #-**BPHYS202** SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination  
**ESC or ETC of 03 credits Courses** shall have only a theory component (L:T :P:S=3:0:0:0) or **if the nature of the of course required experimental learning syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0 ).All 01 Credit-** courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

<b>(ESC-II) Engineering Science Courses-II</b>					<b>(ETC-II) Emerging Technology Courses-II</b>				
<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>BESCK204A</b>	Introduction to Civil Engineering	3	0	0	<b>BETCK205A</b>	Smart materials and Systems	3	0	0
<b>BESCK204B</b>	Introduction to Electrical Engineering	3	0	0	<b>BETCK205B</b>	Green Buildings	3	0	0
<b>BESCK204C</b>	Introduction to Electronics Communication	3	0	0	<b>BETCK205C</b>	Introduction to Nano Technology	3	0	0
<b>BESCK204D</b>	Introduction to Mechanical Engineering	3	0	0	<b>BETCK205D</b>	Introduction to Sustainable Engineering	3	0	0
<b>BESCK204E</b>	Introduction to C Programming	2	0	2	<b>BETCK205E</b>	Renewable Energy Sources	3	0	0
					<b>BETCK205F</b>	Waste Management	3	0	0
					<b>BETCK205G</b>	Emerging Applications of Biosensors	3	0	0
					<b>BETCK205H</b>	Introduction to Internet of Things (IoT)	3	0	0
					<b>BETCK205I</b>	Introduction to Cyber Security	3	0	0
					<b>BETCK205J</b>	Introduction to Embedded System	3	0	0
<b>(PLC-II) Programming Language Courses-II</b>									
<b>Code</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>					
<b>BPLCK205A</b>	Introduction to Web Programming	2	0	2					
<b>BPLCK205B</b>	Introduction to Python Programming	2	0	2					
<b>BPLCK205C</b>	Basics of JAVA programming	2	0	2					
<b>BPLCK205D</b>	Introduction to C++ Programming	2	0	2					
<b>The course BESCK104E/204E, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by ANY DEPARTMENT</b>									

- The student has to select one course from the ESC-II group.
- Civil Engineering Students shall opt for any one of the courses from the ESC-II group **except, BESCK204E-Introduction toC Programming**
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-II or PLC-II group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa

**Skill Lab:** All students have to register for this course during the first week of I/II semester in Physics cycle. Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. This course shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.



**BMS Institute of Technology & Management**  
 (An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
 Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**I Semester**

Course Title:	<b>Mathematics for CSE Stream - I</b>		
Course Code:	BMATS101	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10 to12 Lab slots	Credits	04

**Course objectives:** The goal of the course **Mathematics for CSE Stream - I (BMATS101)** is to

- **Familiarize** the importance of calculus associated with one variable and multivariable for computer science and engineering.
- **Analyze** Computer science and engineering problems by applying Ordinary Differential Equations.
- **Apply** the knowledge of modular arithmetic to computer algorithms.
- **Develop** the knowledge of Linear Algebra to solve the system of equations.

**Teaching-Learning Process**

**Pedagogy (General Instructions):**

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Support and guide the students for self-study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students to group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:
  - As an introduction to new topics (pre-lecture activity).
  - As a revision of topics (post-lecture activity).
  - As additional examples (post-lecture activity).
  - As an additional material of challenging topics (pre-and post-lecture activity).
  - As a model solution of some exercises (post-lecture activity).



**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**Module-1: Calculus (8 hours)**

**Introduction to polar coordinates and curvature relating to Computer Science and Engineering.** Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems.

**Self-study:** Center and circle of curvature, evolutes and involutes.

**Applications:** Computer graphics, Image processing.

**(RBT Levels: L1, L2 and L3)**

**Module-2: Series Expansion and Multivariable Calculus (8 hours)**

**Introduction of series expansion and partial differentiation in Computer Science & Engineering applications.**

Taylor's and Maclaurin's series expansion for one variable (Statement only) – problems.

Indeterminate forms - L'Hospital's rule-Problems.

Partial differentiation, total derivative - differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems.

**Self-study:** Euler's theorem and problems. Method of Lagrange's undetermined multipliers with single constraint.

**Applications:** Series expansion in computer programming, Computing errors and approximations.

**(RBT Levels: L1, L2 and L3)**

**Module-3: Ordinary Differential Equations (ODEs) of first order (8 hours)**

**Introduction to first-order ordinary differential equations pertaining to the applications for Computer Science & Engineering.**

Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations -

Integrating factors on  $\frac{1}{N} \left( \frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} \right)$  and  $\frac{1}{M} \left( \frac{\partial N}{\partial x} - \frac{\partial M}{\partial y} \right)$ . Orthogonal Trajectories, L-R and C-R

circuits. Problems

**Nonlinear differential equations:** Introduction to general and singular solutions, Solvable for p only, Clairaut's equations, reducible to Clairaut's equations. **Problems.**

**Self-Study:** Applications of ODE's: Solvable for x and y.

**Applications of ordinary differential equations:** Rate of Growth or Decay, Conduction of heat.

**(RBT Levels: L1, L2 and L3)**

**Module-4: Modular Arithmetic (8 hours)**

**Introduction of modular arithmetic and its applications in Computer Science and Engineering.**

Introduction to Congruences, Linear Congruences, The Remainder theorem, Solving Polynomials, Linear Diophantine Equation, System of Linear Congruences, Euler's Theorem, Wilson Theorem and Fermat's little theorem. Applications of Congruences-RSA algorithm.

**Self-Study:** Divisibility, GCD, Properties of Prime Numbers, Fundamental theorem of Arithmetic.

**Applications:** Cryptography, encoding and decoding, RSA applications in public key encryption.



**BMS Institute of Technology & Management**  
 (An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
 Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**(RBT Levels: L1, L2 and L3)**

**Module-5: Linear Algebra (8 hours)**

**Introduction of linear algebra related to Computer Science & Engineering.**

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigenvalues and Eigenvectors, Rayleigh's power method to find the dominant Eigenvalue and Eigenvector.

**Self-Study:** Solution of system of equations by Gauss-Jacobi iterative method. Inverse of a square matrix by Cayley- Hamilton theorem.

**Applications:** Boolean matrix, Network Analysis, Markov Analysis, Critical point of a network system. Optimum solution.

**(RBT Levels: L1, L2 and L3).**

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)**

**10 lab sessions + 1 repetition class + 1 Lab Assessment**

1	2D plots for Cartesian and polar curves	
2	Finding angle between polar curves, curvature and radius of curvature of a given curve	
3	Finding partial derivatives and Jacobian	
4	Applications to Maxima and Minima of two variables	
5	Solution of first-order ordinary differential equation and plotting the solution curves	
6	Finding GCD using Euclid's Algorithm	
7	Solving linear congruences $ax \equiv b(\text{mod } m)$	
8	Numerical solution of system of linear equations, test for consistency and graphical representation	
9	Solution of system of linear equations using Gauss-Seidel iteration	
10	Compute eigenvalues and eigenvectors and find the largest and smallest eigenvalue by Rayleigh power method.	

**Suggested software's :** Mathematica/MatLab/Python/Scilab

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to:

CO1	apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
CO2	analyze the solution of linear and nonlinear ordinary differential equations
CO3	get acquainted and to apply modular arithmetic to computer algorithms
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
CO5	familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB

IPCC COURSES: 4 CREDITS





**BMS Institute of Technology & Management**  
 (An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
 Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

Evaluation Type		Internal Assessments	Test/ Exam Marks Conducted for	Marks to be scale down to	Min. Marks to be Scored	Evaluation Details
Theory Component	CIE — IA Tests	CIE — Test 1 (1.5 hr)	40	15	06	Average of two internal assessment tests each of 40 marks, scale down the marks scored to 15 marks
		CIE — Test 2 (1.5 hr)	40			
	CIE — CCAs (Comprehensive Continuous Assessment)	CCA -1	10	10	04	Any two assessment methods as per clause 22OB4.2 of regulations (if assessment is project based, then one assessment method may be adopted)
		CCA-2	10			
<b>Total CIE Theory</b>				25	10	Scale down marks of tests and CCAs to 25
Practical Component	CIE - Practical			15	06	Conduction of experiments and preparation of laboratory records etc.
	CIE Practical Test		50	10	04	One test after all experiment's to be conducted for 50 marks
	<b>Total CIE Practical</b>			25	10	Scale down marks of experiments, record and test to 25
<b>Total CIE Theory + Practical</b>				50	20	
SEE			100	50	18	SEE exam is a theory exam, conducted for 100 marks, scored marks are scaled to 50 marks
CIE + SEE				100	40	

The minimum marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum marks-25) in the theory component and 10 (40% of maximum marks -25) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included in their respective modules only.



**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**Suggested Learning Resources:**

**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

**Text Books**

1. **B. S. Grewal:** “Higher Engineering Mathematics”, Khanna Publishers, 44<sup>th</sup>Ed., 2021.
2. **E. Kreyszig:** “Advanced Engineering Mathematics”, John Wiley & Sons, 10<sup>th</sup>Ed., 2018.
3. **David M Burton:** “Elementary Number Theory” Mc Graw Hill, 7<sup>th</sup> Ed.,2017.

**Reference Books**

1. **V. Ramana:** “Higher Engineering Mathematics” McGraw-Hill Education, 11<sup>th</sup> Ed., 2017
2. **Srimanta Pal & Subodh C.Bhunia:** “Engineering Mathematics” Oxford University Press,3<sup>rd</sup> Ed., 2016.
3. **N.P Bali and Manish Goyal:** “A Textbook of Engineering Mathematics” Laxmi Publications, 10<sup>th</sup> Ed., 2022.
4. **C. Ray Wylie, Louis C. Barrett:** “Advanced Engineering Mathematics” McGraw – Hill Book Co., New York, 6<sup>th</sup> Ed., 2017.
5. **Gupta C.B, Sing S.R and Mukesh Kumar:** “Engineering Mathematic for Semester I andII”, Mc-Graw Hill Education(India) Pvt. Ltd 2015.
6. **H. K. Dass and Er. Rajnish Verma:** “Higher Engineering Mathematics” S. Chand Publication, 3<sup>rd</sup> Ed., 2014.
7. **James Stewart:** “Calculus” Cengage Publications, 7<sup>th</sup>Ed., 2019.
8. **David C Lay:** “Linear Algebra and its Applications”, Pearson Publishers, 4<sup>th</sup> Ed., 2018.
9. **Gareth Williams:** “Linear Algebra with Applications”, Jones Bartlett Publishers Inc., 6<sup>th</sup> Ed., 2017.
10. **Gilbert Strang:** “Linear Algebra and its Applications”, Cengage Publications, 4<sup>th</sup> Ed. 2022.
11. **William Stallings:** “Cryptography and Network Security” Pearson Prentice Hall, 6<sup>th</sup> Ed., 2013.
12. **Kenneth H Rosen:** “Discrete Mathematics and its Applications” McGraw-Hill, 8<sup>th</sup> Ed. 2019.
13. **Ajay Kumar Chaudhuri:** “Introduction to Number Theory”NCBA Publications, 2<sup>nd</sup> Ed., 2009.
14. **Thomas Koshy:** “Elementary Number Theory with Applications”Harcourt Academic Press,2<sup>nd</sup> Ed., 2008.

**Web links and Video Lectures (e-Resources):**

- <http://nptel.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
- <http://academicearth.org/>
- VTU e-Shikshana Program
- VTU EDUSAT Program

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Quizzes
- Assignments



**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

- Seminar

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs						
	1	2	3	4	5	6	7
CO1	3	2					
CO2	3	2					
CO3	3	2					
CO4	3	2					
CO5					3		

**Level 3- Highly Mapped,      Level 2-Moderately Mapped,      Level 1-Low Mapped,      Level 0- Not Mapped**

<b>DEPARTMENT OF CHEMISTRY</b> Choice Based Credit System (CBCS) SEMESTER – I/II			
<b>Applied Chemistry for CSE Stream (2:2:2:0) 4</b> CSE Stream (Effective from the academic year 2022-23)			
Course Title	Applied Chemistry for CSE Stream (For CSE, ISE, CSBS and AIML)		
Course Code	BCHES102/202	CIE Marks	50
Teaching Hours/Week (L:T:P)	2:2:2:0	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	3
<b>Course Objectives:</b> This course will enable students to:			
<ol style="list-style-type: none"> <li>To identify various sustainable technologies in engineering applications.</li> <li>To develop problem solving, critical thinking and analytical reasoning towards scientific problems.</li> <li>To distinguish the use of smart materials for latest development in material research.</li> <li>To appraise the significance of engineering chemistry for industrial and domestic applications.</li> </ol>			
<b>Module – 1</b>			
<p><b>Preamble:</b> Relevance of chemistry in day today activities, Importance of materials in industrial, defence and research application and its economic implications. Influence of new materials for the technological development, study and use of environment friendly materials for healthier society.</p> <p><b>Materials for memory and display systems:</b> Introduction, Basic concepts of electronic memory. Classification of electronic memory devices, types of organic memory devices (organic molecules and polymeric materials). Liquid crystals: Introduction, Classification: Thermotropic liquid crystal and Lyotropic liquid crystals. Differences between liquid crystal and solid/liquid. Chemical constitution and Liquid crystalline behaviour, homologous series. Application of liquid crystals.</p> <p><b>Self-Study:</b> Properties and functions of Silicon (Si), Germanium (Ge), copper (Cu), Aluminium and Brominated flame retardants in computers. LED, LCD and OLED.</p> <p style="text-align: right;">(8Hours)</p>			
<b>Module – 2</b>			
<p><b>Analytical Techniques and Instrumentation:</b> <b>Electrode system:</b> Introduction, types of electrodes. Construction and working of calomel electrode. Ion selective electrode – definition, construction and application of glass electrode. Determination of pH using glass electrode. Electrolyte Concentration cell – Definition, construction, derivation of Nernst equation and numerical problems.</p> <p><b>Analytical Techniques:</b> Introduction, working principle and instrumentation: Potentiometric estimation of iron, Conductometric estimation of mixture of acids and pH metric determination of pK<sub>a</sub> of a weak acid.</p> <p><b>Self-study:</b> Electrochemical and bio-sensors applications.</p> <p style="text-align: right;">(8 Hours)</p>			

\* NOTE: Wherever the contact hours are not sufficient, tutorial hours can be converted to theory hours.

<b>Module – 3</b>
<p><b>Polymers and Green Energy:</b>  <b>Polymers:</b> Introduction, types of polymerization: Addition and Condensation polymerization with example. Molecular weight – Number average, weight average and numerical problems. Conducting polymers – synthesis, mechanism of conduction in poly-acetylene, applications.  <b>Fuel Cells:</b> Introduction, difference between conventional cell and fuel cell, limitations &amp; advantages. Construction &amp; working of H<sub>2</sub>-O<sub>2</sub> fuel cell.  <b>Solar Cells:</b> Introduction, Types of solar energy conversion. Construction and working of Photovoltaic cells.  <b>Self-Study:</b> Regenerative fuel cells.</p> <p style="text-align: right;">(8 Hours)</p>
<b>Module – 4</b>
<p><b>Corrosion Science:</b> Introduction to corrosion. Consequences of corrosion, Types of Corrosion: Chemical and electrochemical corrosion, differential metal corrosion, differential aeration corrosion (waterline and pitting corrosion). Factors affecting corrosion: Nature of metal, nature of corrosion product, ratio of anodic area to cathodic area, nature of environment (pH, temperature, conductivity). Corrosion control: Cathodic protection- Sacrificial anode method and Impressed current method. Protective metal coatings – Cathodic and Anodic coatings- Galvanization and Tinning.  <b>Electroplating:</b> Principle. Electroplating of Chromium- Hard and Decorative Cr plating.  <b>Electroless plating:</b> Principle. Electroless plating of copper.  <b>Self-study:</b> Technological importance of metal plating. Differences between electroplating and electroless plating.</p> <p style="text-align: right;">(8 Hours)</p>
<b>Module – 5</b>
<p><b>Water Technology and E-waste Management:</b>  <b>Quality Control of water:</b> Chemical &amp; Biological oxygen demands (COD and BOD); Definition, significance, differences. Determination of COD by redox titration. Sewage water treatment by primary, secondary and tertiary process. Desalination of water: Definition, reverse osmosis method. Hardness of water and softening of water using ion exchange resin.  <b>E-waste Management:</b> Introduction, sources of e-waste, e-waste management. Health hazards due to exposure to e-waste, recycling and recovery. Extraction of gold metal from e-waste.  <b>Self-Study:</b> Impact of heavy metals on environment and human health.</p> <p style="text-align: right;">(8 Hours)</p>
<p><b>Course outcomes:</b>  The students will be able to:  CO1: To identify various sustainable technologies in engineering applications.  CO2: To develop problem solving, critical thinking and analytical reasoning towards scientific problems.  CO3: To identify various sustainable technologies in engineering applications.  CO4: Understanding the impact of pollution and its management.</p>
<p><b>Question paper pattern:</b></p> <ul style="list-style-type: none"> <li>• <b>SEE</b> will be conducted for 100 marks. Marks will be scale down to <b>50 marks</b>.</li> <li>• Each full question is for 20 marks. (Answer five full questions out of 10 questions with intra modular choice). In every question, there will be a maximum of three sub-questions.</li> </ul>

\* NOTE: Wherever the contact hours are not sufficient, tutorial hours can be converted to theory hours.

This also includes the lab component of 40 Marks out of which 20 Marks are to be answered within the modules.

- **CIE** will be announced prior to the commencement of the course.

**CIE Theory Component:**

- 40 marks for each test. Average of two test will be taken. Marks will be scale down to 15 marks.
- CCAs 1 and 2 will be conducted for 10 marks each. Marks will be scale down to 10 marks. Total CIE Theory is 25 marks.

**CIE Practical Component:**

- Conduction of experiments and preparation of lab records etc is 15 marks.
- CIE Practical test for 50 marks which will be scale down to 10 marks. Total CIE Practical is 25 marks.

**Total CIE Theory + Practical = 50 marks.**

**Final CIE + SEE = 100 marks**

**PRACTICAL MODULE**

**A- Demonstration (any two) offline/virtual:**

- A1. Chemical structure drawing using software: ChemDraw/Avogadro/ChemSketch.
- A2. Estimation of Copper present in electroplating effluent by colorimeter.
- A3. Synthesis of metal oxide nanoparticle.
- A4. Determination of COD of waste water sample.

**B- Exercise (compulsorily any 3 to be conducted):**

- B1. Conductometric estimation of acid mixture.
- B2. Potentiometric estimation of FAS using  $K_2Cr_2O_7$ .
- B3. Determination of  $pK_a$  of vinegar using pH meter.
- B4. Determination of rate of corrosion of mild steel by weight loss method.

**C- Structured Enquiry (compulsorily any 3 to be conducted):**

- C1. Estimation of percentage of available chlorine in the given sample of bleaching powder (Iodometric method).
- C2. Determination of viscosity of oil sample by Ostwald's viscometer.
- C3. Determination of percentage of iron in steel using external indicator method.
- C4. Estimation of Fluoride content using SPADNS by colorimetric estimation.

**D- Open ended Experiments (any two):**

- D1. Determination of percentage of CaO in cement.
- D2. Determination chloride content of water in Argentometry.
- D3. Analysis of mineral content and acidity of soil.
- D4. Determination of percentage of copper in Brass using redox titration.

**Textbooks:**

1. Jain, P. C. and Jain, M. "Engineering Chemistry (For VTU)", Dhanpat Rai & Sons, Delhi, 43<sup>rd</sup> Edition, 2018.
2. O.G. Palanna. "Engineering Chemistry", Tata McGraw Hill Education, Pvt. Ltd, New Delhi, 4<sup>th</sup> Edition, 2015.

**References:**

1. Kent, J. A. "Riegel's Handbook of Industrial Chemistry", CBS Publishers New Delhi, 11<sup>th</sup> Edition, 2003.
2. P.W. Atkins. "Physical Chemistry", Oxford publishers, 8<sup>th</sup> Edition, 2006.
3. Gowariker, V. R.; Viswanathan, N. V. & Sreedhar, J. "Electrochemical Methods", New Age International (P) Ltd. Pub., 3<sup>rd</sup> Edition, 2015.

<b>DEPARTMENT OF MECHANICAL ENGINEERING</b>			
<b>Choice Based Credit System (CBCS)</b>			
<b>SEMESTER – I/II</b>			
<b>COMPUTER AIDED ENGINEERING DRAWING (2:0:2) 3</b>			
B.E.(Common to all branches)			
(Effective from the academic year 2022-23)			
Course Code	BCEDK103/203	CIE Marks	50
Teaching Hours/Week (L:T:P)	2: 0: 2	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	03
<b>Course Objectives:</b>			
This course will enable students to:			
<ol style="list-style-type: none"> <li>1. Illustrate skills of visualizing points and lines to represent the same in two dimensions as per international standards, by manual and computational methods.</li> <li>2. Apply orthographic projections of planes and simple three-dimensional objects.</li> <li>3. Construct isometric projections of solids and development of lateral surfaces</li> </ol>			
<b>Module – 1</b>			
<b>Preamble:</b> Importance of Engineering Drawing, Industrial /defence application, research in the field of ME, Impact of the course on societal and sustainable solutions.			
<b>Introduction to Engineering drawing</b>			
Drawing Instruments and their uses, relevant BIS conventions and standards. Lettering, line conventions, dimensioning, material conventions, and free hand practicing. Coordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz., tangency, parallelism, inclination and perpendicularity.			
Orthographic Projections: Planes of projection.			
<b>Projections of points</b> in all the four quadrants.			
<b>Projections of straight lines</b>			
True length and True inclinations of a line, Apparent length and apparent inclinations of a line. Projection of straight line inclined to both the planes			
(8 Hours)			
<b>Module – 2</b>			
<b>Projections of plane surfaces</b>			
Introduction to projection of plane surfaces, Projection of Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular planes inclined to horizontal and vertical planes.			
(8 Hours)			
<b>Module – 3</b>			
<b>Projections of solids</b>			
Introduction to projections of Solids, Projections of right regular Prisms, Pyramids, Cones, Tetrahedron and Hexahedron (cube) inclined to both the planes.			
(12 Hours)			



<b>Module - 4</b>			
<b>Isometric Projection</b>			
Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones, Hemisphere and spheres. Isometric projection of combination of two solids.			
<b>Development of lateral surfaces</b>			
Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only.			
(8 Hours)			
<b>Module - 5</b>			
<b>Application problems and Multidisciplinary exercises (CIE only)</b>			
Application of projection of lines, planes, solids; Problems on application of isometric projections and development of lateral surfaces.			
<b>Free hand sketching:</b> True free hand, guided free hand, roads, buildings, utensils, hand tools and furniture etc.			
<b>Graphs and charts:</b> Column chart, Pie chart, Line chart, Gantt chart etc using Microsoft excel or suitable software.			
(4 Hours)			
<b>Course Outcomes (COs):</b>			
The students will be able to:			
CO1: Illustrate competence in orthographic projections of points and lines.			
CO2: Apply the concepts of orthographic projections of planes and solids pertaining to industrial drawings.			
CO3: Construct isometric drawings of objects and development of lateral surfaces.			
<b>Continuous Internal Evaluation (CIE)</b>			
<ul style="list-style-type: none"> <li>• CIE shall be evaluated for max. marks of 100 and later the same shall be scaled-down to 50 marks as detailed below:</li> <li>• CIE component should comprise of Continuous evaluation of Drawing work of students based on below detailed weightage.</li> </ul>			
Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Sketching (b)
Module 1	35	15	20
Module 2	35	15	20
Module 3	60	20	40
Module 4	70	30	40
	200	80	120 (Scaled down to 20 Marks)
<b>Total</b>		<b>80</b>	<b>20</b>
Module 5	10	5	5
<b>Consideration of Class work</b>	<b>Total of Modules 1 to 4 [(a) + (b)] = 100 marks will be scaled down to 20 Marks + 10 marks for AAT from Module 5 = 30 marks</b>		

- Two tests covering all the modules is to be conducted and evaluation to be based on SEE pattern, and average marks is to be scaled down to **20 Marks**.

- The final CIE (50) = Class work marks (30) + Test marks (20)

**Question paper pattern:**

- Module 1 and Module 2 will have ONE question each. Student required to answer any ONE question.
- Module 3 will have TWO questions. Student required to answer any ONE question.
- Module 4 will have TWO questions. Student required to answer any ONE question.
- Module 5 is for understanding the application concepts and for practice using the necessary software. This module is not considered for SEE.

**Scheme of Evaluation:**

Each of the question will be distributed in to TWO segments. The first being **SKETCHING** to its actual scale in the sketch book followed by the second segment being **DRAFTING** using a relevant Graphics Software.

Q. No	Question Paper Pattern	Marks for SKETCHING	Marks for DRAFTING	TOTAL MARKS
1	Module 1 and Module 2	5	25	30
2	Module 3	10	30	40
3	Module 4	5	25	30
Total		20	80	100

**Textbooks:**

1. K.R. Gopalakrishna, *Engineering Graphics*, 32nd ed. Bangalore: Subhas Publications, 2013.
2. N.D. Bhatt, *Engineering Drawing*, 48th ed. Gujarat: V. M. Panchal Charutha Publishing House, 2005.

**References:**

1. A Primer on Computer Aided Engineering Drawing, 2nd edition, Published by VTU, Belagavi.
2. Luzadder Warren J., Duff John M Eastern, 2009, Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production, 7th edition, Best Publications.
3. Parthasarathy N. S., Vela Murali, Engineering Drawing, Oxford University Press, 2015.



**BMS Institute of Technology & Management**  
 (An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
 Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

<b>B.E ELECTRONICS AND COMMUNICATION ENGINEERING</b>			
Choice Based Credit System (CBCS)			
SEMESTER – I/II			
<b>Introduction to Electronics Communication (3:0:0) 3</b>			
<b>ESC-I</b>			
<b>(Common to: CSE/ME/EEE/CIV/ISE/AIML)</b>			
<b>(Effective from the academic year 2022-23)</b>			
Course Code:	<b>BESCK104C/204C</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P:S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
<p><b>Course objectives:</b></p> <p><b>This Course will enable students to:</b></p> <ol style="list-style-type: none"> <li>1. To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.</li> <li>2. To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.</li> <li>3. Professionalism &amp; Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.</li> </ol>			
<p><b>Teaching-Learning Process</b></p> <p>These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective</p> <ol style="list-style-type: none"> <li>1. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.</li> <li>2. Arrange visits to nearby PSUs such as BHEL, BEL, ISRO, etc., and small-scale hardware Industries to give brief information about the electronics manufacturing industry.</li> <li>3. Show Video/animation films to explain the functioning of various analog and digital circuits.</li> <li>4. Encourage collaborative (Group) Learning in the class</li> <li>5. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking</li> <li>6. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.</li> <li>7. Topics will be introduced in multiple representations.</li> <li>8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.</li> <li>9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.</li> </ol>			

<b>Module-1</b>
<p><b>Power Supplies</b> –Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers.</p> <p><b>Amplifiers</b> –CE amplifier with and without feedback, multi-stage amplifiers, BJT as a switch, Cut-off and saturation modes. (Text 1) <span style="float: right;"><b>(8 hours)</b></span></p>
<b>Module-2</b>
<p><b>Oscillators</b> – Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage astable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations)</p> <p><b>Operational amplifiers</b> -Operational amplifier parameters, Operational amplifier characteristics, Operational amplifier configurations, Operational amplifier circuits. (Text 1) <span style="float: right;"><b>(8 hours)</b></span></p>
<b>Module-3</b>
<p><b>Boolean Algebra and Logic Circuits:</b> Binary numbers, Number Base Conversion, octal &amp; Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 2: 1.2, 1.3, 1.4, 1.5,2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)</p> <p><b>Combinational logic:</b> Introduction, Design procedure, Adders- Half adder, Full adder (Text 2:4.1, 4.2, 4.3) <span style="float: right;"><b>(8 hours)</b></span></p>
<b>Module-4</b>
<p><b>Embedded Systems</b> – Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC</p> <p><b>Sensors and Interfacing</b> – Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 3) <b>(8 hours)</b></p>
<b>Module-5</b>
<p><b>Applications of Electronic Systems</b></p> <ol style="list-style-type: none"> <li>1. Green tech application: Wind turbine for small power application</li> <li>2. Liquid level control system</li> <li>3. pH neutralization system for waste water treatment</li> <li>4. RFID system</li> </ol> <p style="text-align: right;"><b>(8 hours)</b></p> <p>Recap/Summary of the Course</p>
<p><b>Course Outcomes (Course Skill Set):</b> At the end of the course the student will be able to:</p> <p><b>CO1:</b> Understand characteristics, working principles of semiconductor devices, logic circuits, Op-amps.</p> <p><b>CO2:</b> Apply the acquired knowledge to construct basic electronic circuits for different applications</p> <p><b>CO3:</b> Analyze different analog and digital circuits.</p> <p><b>CO4:</b> Interpret the given case study material related to the applications or technological advancements.</p> <p><b>CO 5:</b> Perform in group to demonstrate the performance of electronic circuits designed for different applications with modern tools and write the report.</p>

**Suggested Learning Resources:**

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. DOI <https://doi.org/10.4324/9781315737980>. eBook ISBN 9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016.

**I Semester**

Course Title:	<b>Introduction to Python Programming</b>		
Course Code:	<b>BPLCK105B</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:0:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

**Course objectives:**

- Learn the syntax and semantics of the Python programming language.
- Illustrate the process of structuring the data using lists, tuples
- Appraise the need for working with various documents like Excel, PDF, Word and Others.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object Oriented Programming concepts in Python.

**Teaching-Learning****Process Pedagogy****(General Instructions):**

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective

1. Use <https://pythontutor.com/visualize.html#mode=edit> in order to visualize the python code
2. Demonstrate and visualize basic data types (list, tuple, dictionary).
3. Chalk and talk online and videos

**Module-1 (8 hours)**

**Python Basics:** Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, **Flow control:** Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit(), **Functions:** def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number

**Textbook 1: Chapters 1 – 3**

**Module-2 (8 hours)**

Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References, Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things,

**Textbook 1: Chapters 4 – 5**

**Module-3 (8 hours)**

**Manipulating Strings:** Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup

**Reading and Writing Files:** Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard,

**Textbook 1: Chapters 6 , 8**

**Module-4 (8 hours)**

**Organizing Files:** The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates, Project: Backing Up a Folder into a ZIP File,

**Debugging:** Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE's Debugger.

**Textbook 1: Chapters 9-10**

### Module-5 (8 hours)

Classes and objects: Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, Classes and functions: Time, Pure functions, Modifiers, Prototyping versus planning,

Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example, The init method, The str method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation,

**Textbook 2: Chapters 15 – 17**

### Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1	Demonstrate proficiency in handling loops and creation of functions.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.
CO3	Develop programs for string processing and file organization
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Apply the python concepts in real-time applications.

### Programming Exercises:

- Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages.
  - Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.
- Develop a program to generate Fibonacci sequence of length (N). Read N from the console.
  - Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).
- Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.
- Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.
- Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary]
- Develop a program to sort the contents of a text file and write the sorted contents



	<p>into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), readlines(), and write()].</p> <hr/> <p>7. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods.</p> <hr/> <p>8. Write a function named DivExp which takes TWO parameters a, b and returns a value c (<math>c=a/b</math>). Write suitable assertion for <math>a&gt;0</math> in function DivExp and raise an exception for when <math>b=0</math>. Develop a suitable program which reads two values from the console and calls a function DivExp.</p> <hr/> <p>9. Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N (<math>N \geq 2</math>) complex numbers and to compute the addition of N complex numbers.</p> <hr/> <p>10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use_init () method to initialize name, USN and the lists to store marks and total, Use get Marks() method to read marks into the list, and display() method to display the score card details.]</p> <hr/>
--	---

<b>COs and POs Mapping (Individual teacher has to fill up)</b>							
<b>Cos</b>	<b>POs</b>						
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>CO1</b>	3						
<b>CO2</b>		3					
<b>CO3</b>			3				
<b>CO4</b>		3					
<b>CO5</b>					3		

**Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped**

## **Suggested Learning Resources:**

### **Text Books**

1. Al Sweigart, “**Automate the Boring Stuff with Python**”, 1<sup>st</sup> Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at <https://automatetheboringstuff.com/>) (Chapters 1 to 18, except 12) for lambda functions use this link: <https://www.learnbyexample.org/python-lambda-function/>
2. Allen B. Downey, “**Think Python: How to Think Like a Computer Scientist**”, 2<sup>nd</sup> Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at <http://greenteapress.com/thinkpython2/thinkpython2.pdf>) (Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above link)

### **Web links and Video Lectures (e-Resources):**

- <https://www.learnbyexample.org/python/>
- <https://www.learnpython.org/>
- <https://pythontutor.com/visualize.html#mode=edit>

### **Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

Quizzes for list, tuple, string dictionary slicing operations using below link

[https://github.com/sushantkhara/Data-Structures-And-Algorithms-with-Python/raw/main/Python%203%20\\_%20400%20exercises%20and%20solutions%20for%20beginners.pdf](https://github.com/sushantkhara/Data-Structures-And-Algorithms-with-Python/raw/main/Python%203%20_%20400%20exercises%20and%20solutions%20for%20beginners.pdf)

<b>Department of Humanities and Social Sciences</b> <b>Choice Based Credit System (CBCS)</b> <b>SEMESTER – I</b>			
<b>Communicative English (1:0:0) 1</b> (Common to all Branches) (Effective from the academic year 2022-2023)			
Course Code	<b>BENGGK106</b>	CIE Marks	50
Teaching Hours/Week (L: T:P)	1:0:0	SEE Marks	50
Total Number of Lecture Hours	15	Exam Hours	01
<b>Course objectives:</b> This course will enable students to <ol style="list-style-type: none"> <li>1. Familiarise with basic English Grammar and Communication Skills in general.</li> <li>2. Identify the nuances of phonetics, intonation and enhance pronunciation skills</li> <li>3. Enhance English vocabulary and language proficiency for better communication skills.</li> <li>4. Learn about Techniques of Information Transfer through presentation.</li> </ol>			
Module – 1			
<b>Preamble: Importance of English grammar, Vocabulary and Communication skills enhancing the employability skills of Engineering graduates.</b>			
<b>Introduction to Communicative English:</b> Communicative English: Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different Styles and levels in Communicative English, Intrapersonal and Interpersonal Communication Skills. <span style="float: right;"><b>3 hours</b></span>			
Module – 2			
<b>Introduction to Phonetics:</b> Phonetic Transcription, Sounds in Phonetics (44 sounds), Diphthongs, Consonants and Vowels, Pronunciation, Common errors in pronunciation, Word accent, Voice modulation, Tone and pitch, Mother Tongue Influence, Various Techniques for Neutralization of Mother Tongue Influence. <span style="float: right;"><b>3 hours</b></span>			
Module – 3			
<b>Introduction to English Grammar:</b> Basic English Grammar: Parts of Speech, Use of Articles and Prepositions. Word Formation, One Word Substitution, Question Tags, Strong and weak forms of Words, Affixes (prefix and Suffix)- Exercises <span style="float: right;"><b>3 hours</b></span>			
Module – 4			
<b>Basic English Communicative Grammar and Vocabulary:</b> Introduction to Vocabulary, All types of Vocabulary -Exercises, Tense and Types of Tenses, The Sequence of Tenses (rules in use) Exercises on Tenses, Abbreviations, Contractions, Word Pairs (Minimal Pairs) <span style="float: right;"><b>3 hours</b></span>			
Module – 5			
<b>Communication Skills for Employment:</b> Information Transfer: Oral Presentation and its Practices. Difference between Extempore\ Public Speaking, Communication Guidelines, Reading and Listing Comprehension-Exercises. <span style="float: right;"><b>3 hours</b></span>			

**Course outcomes:** The students will be able to:

1. Understand and apply basic English grammar for effective communication.
2. Identify the nuances of phonetics, intonation and enhance pronunciation skills.
3. Understand and use all types of English vocabulary and language proficiency.
4. Enhance their knowledge about techniques of information transfer through presentations.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

**Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and Pos (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE

**Textbooks**

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication Principles and Practice, Oxford Publications, 3<sup>rd</sup> Edition, 2015
2. Sanjay Kumar and Pushpa Lata, Communication Skills, Oxford University Press,
3. A Textbook of English Language Communication Skills, (ISBN-978-81-955465-2-7), Published by Infinite Learning Solutions, Bengaluru - 2022.

**References**

1. Gajendra Singh Chauhan, Technical Communication Cengage Learning India Pvt Limited, Latest Revised Edition, 2019
2. Michael Swan, Practical English Usage, Oxford University Press, 2016
3. N.P.Sudharshana and C.Savitha, English for Engineers, Cambridge University Press ,2018

<b>Department of Humanities and Social Sciences</b>			
<b>Choice Based Credit System (CBCS)</b>			
SEMESTER – I/II			
<b>Indian Constitution (1:0:0) 1</b>			
(Common to all Branches)			
(Effective from the academic year 2022-2023)			
Course Code	BICOK107/207	CIE Marks	50
Teaching Hours/Week (L: T:P)	1:0:0	SEE Marks	50
Total Number of Lecture Hours	15	Exam Hours	01
<b>Course objectives:</b> This course will enable students to			
Familiarize with the basic structure of our Indian Constitution.			
Understand the Concept of Fundamental Rights, Directive Principles of State Policy and Fundamental Duties.			
Enhance their knowledge on administrative mechanism at the Union and State government.			
Learn about elections, emergency provisions, amendments and Special constitutional provisions.			
<b>Module – 1</b>			
<b>Preamble:</b> Significance and Scope of the course, Importance of the course in societal, political and economic growth of the nation.			
<b>Introduction and Basic information about the Indian Constitution:</b>			
Indian Constitution: Necessity of the Constitution, Societies before and after the Constitution adoption. Introduction to the Indian constitution, Making of the Constitution, Role of the Constituent Assembly. Salient Features. <span style="float: right;"><b>3 Hours</b></span>			
<b>Module – 2</b>			
<b>Preamble and Fundamental Rights:</b> Preamble of the Indian Constitution & Key concepts of the Preamble. Fundamental Rights (FR's) and its restriction and limitations in different Complex Situations. Case studies <span style="float: right;"><b>3 Hours</b></span>			
<b>Module – 3</b>			
<b>Directive Principles of State Policy and Fundamental Duties:</b>			
Directive Principles of State Policy- Importance and its relevance. Fundamental Duties and their significance. Special Constitutional Provisions for Schedule Castes, Schedule Tribes & Other Backward Classes and Women & Children. <span style="float: right;"><b>3 Hours</b></span>			
<b>Module – 4</b>			
<b>Union and State Administration:</b>			
The Union Executive-The President and The Vice President, The Prime Minister and The Council of Ministers, The Union Legislature -Lok Sabha & Rajya Sabha, Parliamentary Committees, Important Parliamentary Terminologies. The Union Judiciary- The Supreme Court of India and its jurisdiction. Judicial Review and Judicial Activism.			
The State Executive-The Governors, The Chief Ministers and The Council of Ministers, The State Legislature- Legislative Assembly and Legislative Council, The State Judiciary- The State High Courts and its jurisdiction. <span style="float: right;"><b>3 Hours</b></span>			
<b>Module – 5</b>			
<b>Elections, Constitutional Amendments and Emergency Provisions:</b>			
Elections-Electoral Process in India, Election Commission of India: Powers & Functions, Constitutional Amendments- methods and Important Constitutional Amendments ie 42 <sup>nd</sup> , 44 <sup>th</sup> , 61 <sup>st</sup> , 74 <sup>th</sup> , 76 <sup>th</sup> , 77 <sup>th</sup> , 86 <sup>th</sup> , 91 <sup>st</sup> , 100, 101 <sup>st</sup> , 118 <sup>th</sup> , Emergency Provisions-types and its effect. <span style="float: right;"><b>3 Hours</b></span>			

**Course outcomes:** The students will be able to:

1. Understand the basic structure of our Indian Constitution.
2. Analyse the Concept of Fundamental Rights, Directive Principles of State Policy and Fundamental Duties
3. Have knowledge on administrative mechanism at the Union and State government.
4. Understand the system of elections, emergency provisions, amendments and Special constitutional provisions.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

**Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and Pos (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE

**Textbooks**

1. “Constitution of India” (for Competitive Exams), Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2. Durga Das Basu (DD Basu): “Introduction to the Constitution of India” (Students Edition.) Prentice –Hall, 2008.

**Reference Books:**

1. Shubham Singles, Charles E. Haries, and et al, “Constitution of India, Professional Ethics and Human Rights”, Cengage Learning India, Latest Edition – 2019.
2. Merunandan K B, “The Constitution of India”, Merugu Publication, Second Edition, Bengaluru.
3. Justice H N Nagamohan Dhas “Samvidhana Odu” - for Students & Youths, Sahayana, kerekon.



**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**I Semester**

Course Title:	<b>Scientific Foundations of Health</b>		
Course Code:	<b>BSFHK158</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P:S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives:**

The course Scientific Foundations of Health (BSFHK158) will enable the students,

1. To know about Health and wellness (and its Beliefs) & It's balance for positive mindset.
2. To Build the healthy lifestyles for good health for their better future.
3. To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.
4. To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
5. To Prevent and fight against harmful diseases for good health through positive mindset

**Teaching-Learning Process** These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.

- (i) Direct instructional method ( Low/Old Technology),
- (ii) Flipped classrooms (High/advanced Technological tools),
- (iii) Blended learning (Combination of both),
- (iv) Enquiry and evaluation based learning,
- (v) Personalized learning,
- (vi) Problems based learning through discussion,
- (vii) Following the method of expeditionary learning Tools and techniques,
- (viii) Use of audio visual methods. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students. In theoretical applied and practical skills.





**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**Module-1 (03 hours )**

**Good Health & It's balance for positive mindset:** Health -Importance of Health, Influencing factors of Health, Health beliefs, Advantages of good health, Health & Behavior, Health & Society, Health & family, Health & Personality, Psychological disorders-Methods to improve good psychological health, Changing health habits for good health.

**Module-2 (3 hours)**

**Building of healthy lifestyles for better future:** Developing healthy diet for good health, Food & health, Nutritional guidelines for good health, Obesity & overweight disorders and its management, Eating disorders, Fitness components for health, Wellness and physical function, How to avoid exercise injuries.

**Module-3 (3 hours)**

**Creation of Healthy and caring relationships :** Building communication skills, Friends and friendship - Education, the value of relationship and communication skills, Relationships for Better or worsening of life, understanding of basic instincts of life (more than a biology), Changing health behaviors through social engineering.

**Module-4 (3 hours)**

**Avoiding risks and harmful habits :** Characteristics of health compromising behaviors, Recognizing and avoiding of addictions, How addiction develops, Types of addictions, influencing factors of addictions, Differences between addictive people and non addictive people & their behaviors. Effects of addictions Such as..., how to recovery from addictions.

**Module-5 (3 hours)**

**Preventing & fighting against diseases for good health:** How to protect from different types of infections, How to reduce risks for good health, Reducing risks & coping with chronic conditions, Management of chronic illness for Quality of life, Health & Wellness of youth :a challenge for upcoming future, Measuring of health & wealth status.



**BMS Institute of Technology & Management**  
 (An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
 Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**Course outcome (Course Skill Set)**

At the end of the course Scientific Foundations of Health (22SFH18/28) the student will be able to:

CO1	Understand about Health and wellness (and its Beliefs) & It's balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
CO4	Study about avoiding risks and harmful habits in their campus and outside the campus for their bright future
CO5	Learn to fight against harmful diseases for good health through positive mindset.

**COs and POs mapping**

Course Outcomes	Program Outcomes												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	1	2
<b>CO1</b>	<b>3</b>													
<b>CO2</b>	<b>3</b>													
<b>CO3</b>	<b>3</b>													
<b>CO4</b>	<b>3</b>								<b>2</b>	<b>2</b>		<b>2</b>		
<b>CO5</b>	<b>3</b>													



**BMS Institute of Technology & Management**  
(An Autonomous Institute under VTU, Belagavi, Karnataka - 590018)  
Avalahalli, Doddaballapur Main Road, Bengaluru – 560064

**Suggested Learning Resources:**

**Textbook:**

1. **“Scientific Foundations of Health”** – Study Material Prepared by Dr. L Thimmesha, Published in VTU - University Website.
2. **“Scientific Foundations of Health”**- (ISBN-978-81-955465-6-5) published by Infinite Learning Solutions, Bangalore – 2022.
3. **Health Psychology - A Textbook**, FOURTH EDITION by Jane Ogden McGraw Hill Education (India) Private Limited - Open University Press.

**Reference Books:**

1. **Health Psychology (Second edition)** by Charles Abraham, Mark Conner, Fiona Jones and Daryl O’Connor – Published by Routledge 711 Third Avenue, New York, NY 10017.
2. **HEALTH PSYCHOLOGY (Ninth Edition)** by SHELLEY E. TAYLOR - University of California, Los Angeles, McGraw Hill Education (India) Private Limited - Open University Press.
3. **SWAYAM / NPTEL/ MOOCS/ We blinks/ Internet sources/ YouTube videos** and other materials / notes.
4. **Scientific Foundations of Health (Health & Wellness) - General Books** published for university and colleges references by popular authors and published by the reputed publisher.

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments