Study Scheme B. Tech First Year Batch 2017 Onward											
Subject Code	Subject Title	T/P	Sem	Int. Max Marks	Ext. Max Marks	Total Marks	L	T	P	Credits	Group*
BTAS-17101	Engineering Mathematics-I	T	1	40	60	100	3	2	0	4	A
BTAS-17102	Engineering Physics	T	1	40	60	100	3	1	0	3.5	A
BTAS-17103	Business Communication and Presentation Skills	T	1	40	60	100	3	0	0	3	A
BTEE-17101	Basic Electrical Engineering	T	1	40	60	100	3	1	0	3.5	A
BTEC-17101	Basic Electronic Engineering	T	1	40	60	100	3	1	0	3.5	A
BTAS-17106	Engineering Physics Laboratory	P	1	30	20	50	0	0	2	1	A
BTAS-17107	Business Communication and Presentation Skills Laboratory	P	1	30	20	50	0	0	2	1	A
BTEE-17102	Basic Electrical Engineering Laboratory	P	1	30	20	50	0	0	2	1	A
BTEC-17102	Basic Electronic Engineering Laboratory	P	1	30	20	50	0	0	2	1	A
MPD-17101	Mentoring and Professional Development	P	1	50	0	50	0	0	1	0.5	A
Total						750				22	
	Non Credit Mandatory Course										
BTHS-17101**	Value Education, Professional Ethics, Human Rights and Legislative Procedures	T	1	40	60	100	3	0	0		A

Study Scheme B. Tech First Year Batch 2017 Onward											
Subject Code	Subject Title	T/P	Sem	Int. Max Marks	Ext. Max Marks	Total Marks	L	T	P	Credits	Group*
BTAS-17101	Engineering Mathematics-I	T	1	40	60	100	3	2	0	4	B
BTAS-17105	Engineering Chemistry	T	1	40	60	100	3	1	0	3.5	B
BTME-17101	Engineering Drawing	T	1	40	60	100	1	4	0	3	B
BTME-17102	Elements of Mechanical Engineering	T	1	40	60	100	3	1	0	3.5	B
BTCS-17101	Fundamentals of Computer Programming and Information Technology	T	1	40	60	100	3	1	0	3.5	B
BTAS-17108	Engineering Chemistry Laboratory	P	1	30	20	50	0	0	2	1	B
BTCS-17102	Fundamentals of Computer Programming and Information Technology Laboratory	P	1	30	20	50	0	0	2	1	B
BTWP-17101	Workshop Practices	P	1	60	40	100	0	0	6	3	B
MPD-17101	Mentoring and Professional Development	P	1	50	0	50	0	0	1	0.5	B
Total						750				23	

Study Scheme B. Tech First Year Batch 2017 Onward											
Subject Code	Subject Title	T/P	Sem	Int. Max Marks	Ext. Max Marks	Total Marks	L	T	P	Credits	Group*
BTAS-17104	Engineering Mathematics-II	T	2	40	60	100	3	2	0	4	A
BTAS-17105	Engineering Chemistry	T	2	40	60	100	3	1	0	3.5	A
BMTE-17101	Engineering Drawing	T	2	40	60	100	1	4	0	3	A
BTME-17102	Elements of Mechanical Engineering	T	2	40	60	100	3	1	0	3.5	A
BTCS-17101	Fundamentals of Computer Programming and Information Technology	T	2	40	60	100	3	1	0	3.5	A
BTAS-17108	Engineering Chemistry Laboratory	P	2	30	20	50	0	0	2	1	A
BTCS-17102	Fundamentals of Computer Programming and Information Technology Laboratory	P	2	30	20	50	0	0	2	1	A
BTWP-17101	Workshop Practices	P	2	60	40	100	0	0	6	3	A
MPD-17101	Mentoring and Professional Development	P	2	50	0	50	0	0	1	0.5	A
Total						750				23	

Study Scheme B. Tech First Year Batch 2017 Onward											
Subject Code	Subject Title	T/P	Sem	Int. Max Marks	Ext. Max Marks	Total Marks	L	T	P	Credits	Group*
BTAS-17104	Engineering Mathematics-II	T	2	40	60	100	3	2	0	4	B
BTAS-17102	Engineering Physics	T	2	40	60	100	3	1	0	3.5	B
BTAS-17103	Business Communication and Presentation Skills	T	2	40	60	100	3	0	0	3	B
BTEE-17101	Basic Electrical Engineering	T	2	40	60	100	3	1	0	3.5	B
BTEC-17101	Basic Electronic Engineering	T	2	40	60	100	3	1	0	3.5	B
BTAS-17106	Engineering Physics Laboratory	P	2	30	20	100	0	0	2	1	B
BTAS-17107	Business Communication and Presentation Skills Laboratory	P	2	30	20	100	0	0	2	1	B
BTEE-17102	Basic Electrical Engineering Laboratory	P	2	30	20	100	0	0	2	1	B
BTEC-17102	Basic Electronic Engineering Laboratory	P	2	30	20	100	0	0	2	1	B
MPD-17101	Mentoring and Professional DEvelopment	P	2	50	0	50	0	0	1	0.5	B
Total										22	
	Non Credit Mandatory Course										
BTHS-17101**	Value Education, Professional Ethics, Human Rights and Legislative Procedures	T	2	40	60	100	3	0	0		B

* Group A: Physics Group, Group B: Chemistry Group
**For BTHS-17101, student has to pass separately internal and external examination by scoring atleast 40% marks.

Subject Code: BTAS-17101

Subject Name: Engineering Mathematics-I

Programme :	B.Tech	**L : 3,** **T : 2 ,** **P : 0**
Branch :	All Branches	**Teaching hrs : =** 40 hr
Semester :	1/2	**Credits :** 4
Theory / Practical : Theory		**Percentage of Numerical /Design Problems:** 90 %
Int.Max.Marks : 40		**Duration of End Semester Exam (ESE) :** 3 hr

Pre-requisites: Trigonometric formulas , methods of differentiation , methods of integration , solution to first order ordinary differential equation- variable separable method to Homogeneous first order ordinary differential equations.

Co-requisites : Knowledge of making computer algorithms in C for curve tracing, and maxima- minima problems.

Additional Material Allowed in ESE :   (i) Scientific Calculator   (ii) Log Table

On Completion of the course , the student will have the ability to :

CO #	Course Outcome
CO1	Apply the standard calculus computations on parametric and polar curves
CO2	Understand the use of Taylor's and Maclaurin's series of one and two variables, the concepts of function of two or three variables.
CO3	Use the concept of multiple integration to find area &volumes.
CO4	Demonstrate an understanding towards the nature of curves by tracing the same using certain properties.
CO5	Apply concept of rank to solve system of linear equations and eigenvalues/eigenvectors to diagonalize the matrices.

PART-I

UNIT1: PARTIAL DERIVATIVES AND ITS APPLICATIONS: [9 hours]

Function of two or more variables, Partial differentiation, Homogeneous functions and Euler's theorem, Composite functions Total derivative, Derivative of an implicit function, Definition of Jacobian. Tangent and normal to a surface, Taylor's and Maclaurin's series for a function of two variables (without proofs), Errors and approximation, maxima and minima, Lagrange's method of multipliers.

UNIT 2: CURVE TRACING: [8 hours]

Increasing/decreasing, Maxima/minima, points of inflection, asymptotes, double points, cusp, nodes etc Tracing of Standard Cartesian, Parametric and Polar curve. Curvature of Cartesian curves.

UNIT 3: MUPLIPLE INTEGRALS: [6 hours]

Double and triple integral and their evaluation, change of order of integration, change of variable, Application of double and triple integration to find areas and volumes.

PART-II

UNIT 4: VECTOR CALCULAS: [10 hours]

Scalar and vector fields, differentiation of vectors, velocity and acceleration. Vector differential operators: Del, Gradient, Divergence and Curl, their physical interpretations. Formulae involving Del applied to point functions and their products. Line, surface and volume integrals. Application of Vector Calculus: Flux, Solenoidal and Irrotational vectors. Gauss Divergence theorem (without proof), Green's theorem in plane (without proof), Stoke's theorem (without proof) and their applications.

UNIT 5. LINEAR ALGEBRA: [7 hours]

Rank of a matrix, Elementary transformations, Linear independence and dependence of vectors, reduction to normal form, Consistency and solution of linear algebraic equations, Eigen values, Eigen vectors, Cayley-Hamilton Theorem, Reduction to diagonal form.

Text Books

1. Sandhu G.S., Pathania D.S., Aujla J.S., Pragya, Engineering Mathematics-I,   First world Publications.
2. Jain, R.K and Lyengar, S.R.K., Advanced Engineering Mathematics, Narosa Publishing Company. · Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi.

Reference Books

1.   Thomes, G.B, Finney, R.L. Calculus and Analytic Gemetry, Ninth Edition, Peason   Education.
2.   Kreyszig, E., Advanced Engineering Mathematics, Eighth edition, John wiley.
3.   Peter. V. O" Nil, Advanced Engineering Mathematics, Wordsworth Publishing Company.
4.   Taneja, H.C., Engineering Mathematics, Volume-I & Volume-II, I.K. Publisher.
5.   Babu Ram, Advance engineering Mathematics, Pearson Education.
6.   Bindra,. J.S., Applied Mathematics, Volume-I, Kataria Publications.

E books and online learning materials

(1) Advanced Engineering Mathematics, Alan Jeffrey, Academic Press, 19 June 2001.

https://books.google.co.in/books/about/Advanced_Engineering_Mathematics.html?id=9nFDvk9yr3kC

[Accessed on: Nov, 2, 2017]

(2) Engineering Mathematics, K. A. Stroud, Dexter J. Booth, Industrial Press, 2001.
https://books.google.co.in/books/about/Engineering_Mathematics.html?id=FZncL-xB8dEC

[Accessed on: Nov, 2, 2017]

(3) htttp://ocw.mit.edu/courses/mathematics/

Online Courses and Video Lectures:

(1)   https://www.youtube.com/results?search_query=online+engineering+mathematics+teaching

(2)   https://onlinecourses.nptel.ac.in/explorer/search?category=all

Subject Code: BTAS-17102
Subject Name: Engineering Physics

Programme:	B.Tech	**L :**	3,	**T:**	1,	**P:** 0
Branch:	All Branches	**Teaching hrs:**	= 40hr			
Semester:	1/2	**Credits:**	3.5			
Theory/Practical:	Theory	**Percentage of Numericals/ Design Problems:** 30%				
Int. Max. Marks:	40	**Duration of End Semester Exam (ESE) :** 3 hr				
Ext. Max. Marks:	60	**Elective Status:** Compulsory				
Total Marks:	100					

Prerequisites: Basics of Electromagnetism, Optics, Newtonian Mechanics and Solid State Physics.

Co-requisites: Partial differential equations, multiple integrals and vector calculus.

Additional Material Allowed in ESE: Scientific Calculator

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Understand basics of electromagnetism and its applications in variety of phenomenon/processes.
CO2	Understand the basics of crystallography and its applications.
CO3	Explain the lasing action & the working of optical fibres and their role in communication.
CO4	Comprehend and apply the concept of relativity in non relativistic & relativistic realms.
CO5	Recognize the adequacy of quantum & classical mechanics for different physical problems.
CO6	Gain basic knowledge in the emerging fields of superconductivity and nanotechnology.

BTAS-17102

PART-I

UNIT - 1: BASICS OF ELECTROMAGNETIC THEORY   [5 hours]

Physical significance of Gradient, Divergence & Curl, Relationship between Electric Field & Potential,   Maxwell's Equations, Equations of EM waves in free space, velocity of EM waves, Intensity of EM waves, Poynting vector.

UNIT-2: QUANTUM THEORY   [5 hours]

Origin of Quantum Theory, Wave-Particle Duality, Matter Waves, Phase velocity, Group velocity, Uncertainty Principle, Significance &Normalization of wave function, Eigen Functions & Eigen Values, Time Independent Schrodinger wave equation, Particle in a box (One Dimensional Case).

UNIT-3: SPECIAL THEORY OF RELATIVITY: [5 hours]

Einstein's postulates, Lorentz Transformation Equations, Length Contraction, Time Dilation, Addition of Velocity, Variation of mass with velocity, Mass-Energy & Energy-Momentum relations.

UNIT-4: CRYSTALLOGRAPHY   [5 hours]

Lattice, Basis, Unit Cell, Bravais Lattice, Crystal Systems, Lattice Planes, Miller Indices, Spacing between lattice planes, X ray diffraction, Bragg's Law & its applications in crystallography, Bragg's spectrometer.

PART-II

UNIT-5: RUDIMENTS OF SUPERCONDUCTIVITY: [5 hours]
Introduction to Superconductivity,   peculiar properties of Superconducting state, Meissner Effect, Type I & Type II Superconductors, London Equations, Introduction to BCS Theory and High Temperature Superconductors.

UNIT-6: NANOPHYSICS   [5 hours]
Nanoscale, Surface to Volume Ratio, Classification of   Nanomaterials, Synthesis & Properties of Nanomaterials, Introduction to Carbon Nanotubes, Applications & Potential Risks of Nanomaterials.

UNIT-7:   LASERS   [5 hours]
Spontaneous & Stimulated Emissions, Einstein's Coefficients, Components of laser, Three level & Four level laser systems, He-Ne laser, CO_2 laser & its industrial applications, Semiconductor laser, Introduction to Holography and Q-switching (qualitative approach).

UNIT-8:   FIBRE OPTICS   [5 hours]
Introduction to Optical Fibres, Acceptance Angle, Numerical Aperture, Normalized Frequency (V-number), SI & GRIN fibres, Single Mode and Multi Mode fibres, Pulse Dispersion, Attenuation through optical fibres, Introduction to Splices, Connectors & Couplers.

Text Books
(1) A Text Book of Engineering Physics, M. N. Avadhanulu, revised edition, 2014, S. Chand Publishers.
(2) Physics for Scientists & Engineers (Vol I & II), Serway & Jewett, 6th edition, Cengage Learning.
(3) Principles of Engineering Physics (Vol I & II), M. N. Khan, S. Panigrahi, 1st edition, 2016, Cambridge University Press.
(4) Engineering Physics, D. R. Joshi, 1st edition, second reprint, 2014, McGraw Hill.

Reference Books
(1) Introduction to Electrodynamics, D. J. Griffiths, 4th edition, 2012, Prentice Hallof India.
(2) Concepts of Modern Physics, A. Beiser, S. Mahajan, S. R. Choudhary, 7th edition, 2015, Tata McGraw Hill.
(3) Introduction to Special Relativity and Space Science, S. P. Singh, 1st edition, 2012, Wiley-India.
(4) A Primer of Special Relativity, P. L. Sardesai, 1st edition, 2004, New Age International Ltd.
(5) Material Science & Engineering, V.   Raghvan 6th edition, 2015, Prentice Hallof India.

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(6) Material Science & Engineering, W. D. Callister, 7th edition, 2007, John Wiley & Sons.
(7) Solid State Physics, D. Wei, 1st edition, 20008, Cengage Learning.
(8) Introduction to Solids, L. V. Azároff, new edition, 2017, Tata McGraw Hill.
(9) Introduction to Superconductivity, M. Tinkham, 2nd edition, 1996, Dover Publications.
(10) Nanotechnology, R. Rakesh, 2nd edition, 2014, S. Chand Publishers.
(11) Nanomaterials, A. K. Bandyopadhyay,2nd edition, 2017, New Age International Ltd.
(12) Lasers & Non-Linear Optics, B. B. Laud, 3rd edition, 2015, New Age International Ltd.
(13) Lasers: Fundamentals & Applications, K. Thyagarajan, A. K. Ghatak, 2nd edition, 2010, Springer.
(14) Fibre Optic Communication, J. C. Palais, 5th edition, 2011, Pearson India.

E books and online learning materials
(1) Relativity: The Special and General Theory, A. Einstein, 1st edition, 1916, Methuen & Co Ltd
  https://www.marxists.org/reference/archive/einstein/works/1910s/relative/relativity.pdf
  [Accessed on: Jul 29, 2017]
(2) Introduction to The Theory of Superconductivity, N. B. Kopnin, Helsinki University of Technology
  http://www.freebookcentre.net/physics-books-download/Introduction-to-The-Theory-of-Superconductivity-(PDF-82P).html   [Accessed on: Jul 29, 2017]
(3) MIT open courseware on Electromagnetism
  https://ocw.mit.edu/courses/physics/8-02t-electricity-and-magnetism-spring-2005/lecture-notes/
  [Accessed on: Jul 29, 2017]
(4) MIT open courseware on Quantum Mechanics
  https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2016/lecture-notes/
  [Accessed on: Jul 29, 2017]
(5) MIT open courseware on Special theory of Relativity
  https://ocw.mit.edu/courses/physics/8-033-relativity-fall-2006/lecture-notes/   [Accessed on: Jul 30, 2017]
(6) Lecture notes on Lasers https://www.physics.ohio-state.edu/~dws/class/780.il/780.il.html
  [Accessed on: Jul 30, 2017]
(7) Lecture notes on Optical Communication http://nptel.ac.in/downloads/117101054/   [Accessed on: Jul 30, 2017]
(8) MIT open courseware on Applied Superconductivity
  https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-763-applied-superconductivity-fall-2005/lecture-notes/   [Accessed on: Jul 29, 2017]

Online Courses and Video Lectures:
(1) http://nptel.ac.in/courses/122106027/36   [Accessed on: Jul 29, 2017]
(2) http://nptel.ac.in/courses/118104008/   [Accessed on: Jul 29, 2017]
(3) http://nptel.ac.in/courses/122107035/31
(4) http://nptel.ac.in/courses/115104088/   [Accessed on: Jul 29, 2017]
(5) https://www.youtube.com/watch?v=KOfXsQAGGWs   [Accessed on: Jul 29, 2017]
(6) https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2013/lecture-videos/
  [Accessed on: Jul 29, 2017]
(7) https://ocw.mit.edu/resources/res-6-005-understanding-lasers-and-fiberoptics-spring-2008/laser-fundamentals-i/
  [Accessed on: Jul 29, 2017]
(8) https://ocw.mit.edu/resources/res-6-005-understanding-lasers-and-fiberoptics-spring-2008/fiberoptics-fundamentals/   [Accessed on: Jul 29, 2017]

Subject Code: BTAS-17103
Subject Name: Business Communication and Presentation Skills

Programme:	B.Tech	**L :** 3, **T:** 0, **P:** 0	
Branch:	All Branches	**Teaching hrs:** = 30hr	
Semester:	1/2	**Credits:** 3	
Theory/Practical:	Theory	**Percentage of Numericals/ Design Problems: NA**	
Int. Max. Marks:	40	**Duration of End Semester Exam (ESE) :** 3 hr	
Ext. Max. Marks:	60	**Elective Status:** Compulsory	
Total Marks:	100		

Prerequisites: Concept of communication, Significance of communication in business organisation, Significance of acquiring effective listening skills, Nature and importance of oral presentation, Planning and preparing of presentation, Group discussion, Job interview strategy.

Co-requisites: Dynamics of effective writing, Reading strategies.

Additional Material Allowed in ESE: NA

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Understand the process of communication and significance of communication in business organization.
CO2	Understand the style and format of writing letter, email and report.
CO3	Comprehend the significance of listening skills.
CO4	Hone their reading skills and understand reading strategies.
CO5	Grasp the basics of group discussion.
CO6	Learn the pre-interview preparation techniques and how to project a positive image during interview.

BTAS-17103

PART-I

UNIT - 1: FUNDAMENTALS OF BUSINESS COMMUNICATION [4 hours]

Communication: Concept of communication; Process of Communication; Types of communication: Verbal &Non-Verbal; Classification of Non-verbal Communication-Kinesics, Proxemics, Paralanguage. Significance of communication in Business organization; Channels of Communication; Barriers to communication.
Technical Communication: concept, Difference between Technical and General Communication; Style and organisation of technical communication.

UNIT-2: BUSINESS WRITING [4 hours]

Letters, circular and notice, Inter-office Memorandum, E-mail, Reports,Job Application Letter, Resume and Curriculum vitae.

UNIT-3: LISTENING SKILLS [4 hours]

Significance of acquiring effective Listening Skills; Process of Listening; Types of listening; Qualities of a good listener; Barriers to effective Listening. Feedback Skills.

UNIT-4: READING SKILLS [3 hours]

Reading Process; Reading comprehension; Reading Strategies; Intensive Reading Skills.

PART-II

UNIT-5: DISCUSSION SKILLS [4 hours]
Group Discussion; Nature of Group discussion; Characteristics of Successful Group discussion; Group Discussion strategies.
Conducting a meeting :Structure of a meeting ;Preparation of Agenda & Minutes of meeting.

UNIT-6: THE INTERVIEW SKILLS [4 hours]
Purpose and process of Job Interviews; Pre-interview preparation Techniques; Interview Questions &Answering strategies; Frequently asked Questions; Projecting a Positive Image-Dress code, good manners and positive behaviour.

UNIT-7: EFFECTIVE PRESENTATION SKILLS [4 hours]
Nature & Importance of Oral Presentation; Elements of Effective Presentation-Defining Purpose, Audience analysis, Body language and use of voice during presentation. Planning and Preparation of Presentation; Organizing & Rehearsing the presentation; Improving Delivery.

UNIT-8: WRITING SKILL [3 hours]
Dynamics of Effective writing; Paragraph Writing

Text Books
(1) Effective Technical Communication, M. Ashraf Rizvi,, 16th reprint, 2010, McGraw Hill.

Reference Books
(1) Fundamentals of Technical Communication, 1st edition, 2014, Oxford university Press.
(2) Handbook of Practical communication, Chrissi Wright 1st edition, 2005, aico Publishing House, Mumbai.
(3) Effective business Communication, Asha Kaul, 2nd edition, 2004, Prentice Hall of India.
(4) Communication Skills For Engineers, Sunita Mishra & C. Mualikrishna, 2nd edition, 2011, Pearson Education.
(5) Essentials of Business Communication, Rajinder Pal & J.S..Korlahalli, 1st edition, 2011, Sultan Chand & Sons.

BTAS-17103

(6) Gartside's Model Business Letters &Other business Documents, Shirley Taylor, 1st edition, 1998, Financial Times Pitman Publishing.

E books and online learning materials

(1) Effective Communication Skills, Book Boon, 2010
http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf
[Accessed on: Aug 05, 2017]

(2) Advanced Communication Skills, Book Boon, 2010
http://promeng.eu/downloads/training-materials/ebooks/soft-skills/advanced-communication-skills.pdf
[Accessed on: Aug 05, 2017]

(3) https://www.coursera.org/learn/wharton-communication-skills   [Aug 05, 2017]

(4) http://nptel.ac.in/reviewed_pdfs/109104031/lec1.pdf [Aug 05, 2017]

Online Courses and Video Lectures:

(1) http://freevideolectures.com/Course/3430/Communication-Skills   [Aug 05, 2017]

(2) https://www.youtube.com/watch?v=8p9ygCfC3ag   [Aug 05, 2017]

COURSE NAME: BASICS OF ELECTRONICS ENGINEERING

COURSE CODE: BTEC-17101

Internal Marks: 40   **L   T   P**

External Marks: 60   **3   1   -**

Numerical & Design Problems Content: 10%-20%

Note: The Question paper shall have three sections:

Section A shall consist of one question with 10 sub-questions of two (02) marks each. **Section B** shall consist of five questions of five (05) marks each, out of which four questions are required to be attempted by the candidate. **Section C** shall consist of three questions of ten (10) marks each, out of which two questions are required to be attempted by the candidate. Any question of **Section C** may be sub–divided (if required) into two parts of five (05) marks each.

Course Outcomes

On successful completion of this course, the students should be able to:

CO	Definition	POs	PSOs
C01	Apply the knowledge of working principle of diode and transistor for utilization in different applications	1(H)	1(M)
C02	Understand the basic concept of feedback in amplifiers and applying for designing LC and RC oscillators.	1(M)	1(L)
CO3	Comprehend the basic concept of Binary Number System and apply for Boolean problems.	1(M)	1(L)
CO4	Design solutions for digital electronics circuits using basic Combinational Circuits and flip-flops.	3(H)	1(H)
CO5	Select and utilize electronic instruments for solving electronics circuit problems.	5(H)	1(M)
CO6	Analyze performance of different types of Analog modulation Techniques.	2(H)	1(M)

BTEC-17101

PART-I

Unit 1: Introduction to Electronics

Semiconductors, Intrinsic Semiconductor, Extrinsic Semiconductor, P-N Junction Diode Operation, Junction Theory, V-I Characteristics of P-N Junction Diode, Ideal Diode, Static and Dynamic Resistance of a diode, Diode Applications, Zener diode as a regulator, LED, Photodiode.

Unit 2: Transistor and its Applications

Introduction to Transistors, Working of a Transistor, Transistor amplifying action, Three configurations and their comparison, Transistor Characteristics, Need for biasing, Selection of Operating point, Need for Bias Stabilisation, Applications of a Transistor.

Unit 3: Oscillators

Concept of Feedback in Amplifiers, Types of Feedback along with their merits and demerits, Principle of Oscillators, LC and RC oscillators.

PART-II

Unit 4: Digital Circuits

Digital Signals, Basic Digital Logic Gates: AND, OR, NOT, Universal Logic Gates, Boolean algebra, Binary Number System, Binary Addition and Subtraction, Working of Combinational Circuits: Adder, Subtractor and Multiplexer, Working of Flip Flops.

Unit 5: Electronic Instruments

Electronics Multimeter, Cathode Ray Oscilloscope (CRO), Audio Signal Generator.

Unit 6: Communication Engineering

Brief introduction to the concept of Modulation, Need of Modulation, Introduction to AM, FM and PM.

Text Books:
1. Jacob Millman, Christos Halkias, Chetan Parikh, "Millman's Integrated Electronics" Paperback, 2nd Edition.
2. Donald P. Leach, Albert Paul Malvino, GoutamSaha, "Digital Principles and Applications", McGraw Hill Education; Eighth edition.
3. Kennedy Davis, "Electronics Communication Systems" Paperback, 4th edition.

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Reference books and other resources:
1. N. N. Bhargava, S. C. Gupta, D. C. Kulshreshtha "Basic Electronics and Linear Circuits", Tata McGraw-Hill Education.
2. R.P. Jain, "Modern Digital Electronics", Tata McGraw Hill Publications, 4th edition.
3. NPTEL Course on: Basic Electronics and Lab
   http:// nptel.ac.in/courses/122106025/

Subject Code: BTEE-17101

Subject Name: Basic Electrical Engineering

Programme:	B. Tech	**L: 3,** **T: 1,** **P: 0**	
Branch:	All Branches	**Teaching hrs:** = 40hrs	
Semester:	1/2	**Credits:** 4	
Theory/Practical:	Theory	**Percentage of Numerical/Design Problems:** 30%	
Int. Max. Marks:	40	**Duration of End Semester Exam(ESE):** 3 hrs	
Ext. Max. Marks:	60	**Elective Status:** Compulsory	
Total Marks:	100		

Prerequisites: Basic laws related to Electrostatics and Magneto statics, Basic Knowledge of Electric Circuits and magnetic circuits, semiconductor materials

Co-requisites: Knowledge of Ammeter, Voltmeter, Wattmeter and Multi-Meter.

Additional Material Allowed in ESE: (i) Scientific Calculator.

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Analyze the behavior of electrical and magnetic circuits.
CO2	Analyze the various electrical networks.
CO3	Apply the knowledge of AC and DC fundamentals.
CO4	Realize the requirement of transformers in transmission and distribution of electric power and other applications.
CO5	Select the type of generator / motor required for a particular application.
CO6	Demonstrate the knowledge of various measuring instruments.

BTEE-17101
PART-I

UNIT-1: INTRODUCTIONTO ELECTRICAL ENGINEERING [8 hours]

Essence of electricity, Conductors, semiconductors and insulators, Electric field; electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow,force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction, Types of induced EMF's, Kirchhoff's laws.

UNIT-2: NETWORK ANALYSIS [5 hours]

Basic definitions, types of elements, types of sources, star delta and delta star transformation, Network theorems-Superposition, Thevenins's, Norton, Maximum power transfer theorems.

UNIT-3: ALTERNATING QUANTITIES [9 hours]

Principle of ac voltages, waveforms and basic definitions, relationship between frequency, speed and number of poles, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits.

PART-II
UNIT-4: MAGNETIC CIRCUITS& TRANSFORMERS [6 hours]

Basic definitions, analogy between electric and magnetic circuits, magnetization characteristics of Ferro magnetic materials, self inductance and mutual inductance, coils connected in series, Construction & operation of transformer, EMF Equation, Losses &Efficiency.

UNIT-5: ROTATING MACHINES [7 hours]

Construction & operation of DC Machines (Motor and Generator), e.m.f& torque equation in a dc machine, Construction & Principle of operation of Single phase &three phase induction motors,e.m.f equations, torque equations & applications of different machines.

UNIT-6: BASIC INSTRUMENTS [5 hours]

Introduction, classification of instruments, operating principles, permanent magnetmoving coil andmoving ironinstruments.

Textbooks
(1) B.L. Theraja and A.K. Theraja "*A Textbook of Electrical Technology*"S. Chand Publishers.
(2) Vincent Del Toro, "*Electrical Engineering Fundamentals*", PHI Learning Pvt Ltd.
(3) D.P.Kothari& I.J. Nagrath, "*Theory and Problems of Basic Electrical Engineering*", PHI Learning Pvt Ltd.
(4) S.K.Bhattacharya, "*Basic Electrical and Electronics Engineering*", Pearson Education,2012.
(5) Van Valkenburgh,"*Basic Electrical Engineering*",Cengage learning.

Reference books
(1) V.K Mehta, "*Principles of Electrical Engineering*",S.Chand Publishers.
(2) David V. Kerns, JR. J. David Irwin "*Essentials of Electrical and Computer Engineering*",Pearson Education.
(3) H. Cotton,"*Electrical Technology*", CBS Publishers.
(4) Rizzoni,"*Principles and Application of Electrical Engineering*", McGraw Hill Publishers.
(5) Stanley, Hackworth Jones,"*Fundamentals of Electrical Engineering and Technology*", Cengage Learning.

BTEE-17101

E-Books and Online Learning Material
(1) Basic Electrical Engineering, Abhijit Chakrabarti,Sudipta nath, Chandan Kumar Chanda , Tata Mc Graw Hill Publishing Company Limited, Edition 2009
https://books.google.co.in/books?isbn=0070669309
(2) Basic Electrical Engineering , C.L. Wadhwa, New Age International (P) Limited, 2006
https://books.google.co.in/books?isbn=8122417515
(3) *www.electrical4u.com*

Online Courses and Vedio Lectures
(1) *https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC_ENGG*
(2) *https://www.youtube.com/results?search_query=basic+Electrical+engg+lectures*

Subject Code: BTHS-17101

Subject Name: Value Education, Professional Ethics, Human Rights and
Legislative Procedures

Programme:	B.Tech	**L :** 3,	**T:** 0,	**P:** 0
Branch:	All Branches	**Teaching hrs:** = 30 hr		
Semester:	1/2	**Credits:** NA (Mandatory Course)		
Theory/Practical:	Theory	**Percentage of Numericals/ Design Problems: NA**		
Int. Max. Marks:	40	**Duration of End Semester Exam (ESE) :** 3 hr		
Ext. Max. Marks:	60	**Elective Status:** Compulsory (Non Credit)		
Total Marks:	100			

Prerequisites: General Awareness about Social Values**.**

Co-requisites: NA.

Additional Material Allowed in ESE: NA.

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Understand the values required to be a good human being and apply these values in real life.
CO2	Understand fundamental and organizational duties and protect individual and social rights.
CO3	Evaluate and modify his behavior.
CO4	Evaluate and modify the behavior of other person to ensure effective and efficient team work.
CO5	Apply ethical principles to ensure social responsibility and sustainable growth.
CO6	Use legal machinery against exploitation

PART-I

UNIT - 1: VALUE EDUCATION   **[5 hours]**

Need for value education, Basic guidelines, Self Exploration, Values in family and Harmony in existence, values across cultures.

UNIT-2: HUMAN RIGHTS   **[4 hours]**

Definition, Fundamental rights and duties, Regional, National and Universal protection of human rights, Human rights and vulnerable groups.

UNIT-3: PERSONALITY AND BEHAVIOR DEVELOPMENT   **[6 hours]**

God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Aware of self destructive habits, Association and cooperation, Doing best, Motivation Theories and Case study, Johari Window, Leadership Styles and Theories, Win-Win policy, SWOT Analysis..

PART-II

UNIT-4: PROFESSIONAL ETHICS   **[9 hours]**
Definition and meaning, Unethical practices, Social responsibility, Ethical principles and theories, Global Issues (Technology revolution, International trade, Globalization, Environmental ethics, Media ethics, War ethics and Intellectual property rights), Business ethics-nature, characteristics, need and case studies.

UNIT-5: LEGISLATIVE PROCEDURES   **[6 hours]**
Prevention and settlement of disputes, Types of courts, consumer court, civil court, labour court, Factory Act 1948 (definitions, working hours, weekly rest and leave with wages), RTI Act, Vigilance, Individual freedom of choice, Professional codes, Relationship between law and ethics, Fair trade practices.

Text Books
(1) Values and Ethics for Organizations Theory and Practice, S. K. Chakraborty, 2nd edition, 2001, Oxford University Press.
(2) Human rights under International Law and Indian Law, S. K. Kapoor, 2002, 1st edition, 2002, Prentice Hall of India.
(3) Indian Constitution, D. D. Basu, 3rd edition, 2015, Oxford University Press.
(4) Human Values and Professional Ethics, R. R. Gaur, R. Sangal and G. P. Bagaria, 2nd edition, 2013, Excel Books.
(5) Professional Ethics, R. Subramanian, 1st edition, 2013, Oxford University Press.

Reference Books
(1) Ethics, W. K. Frankena, 1st edition, 2015, Pearson.
(2) Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, 2000, Oxford University Press.
(3) Human Resource Management: Concepts and Issues, T. N. Chhabra, 6th edition, 2016, Dhanpat Rai and Co.

E books and online learning materials
(1) Values Education and Lifelong Learning, **Aspin**, N. David, **Chapman**, D. Judith. (Eds.), 1st edition, 2007
http://www.springer.com/in/book/9781402061837 [Accessed on: Jul 28, 2017]

Online Courses and Video Lectures:
(1) https://www.youtube.com/watch?v=IE05i_jTgzA   [Accessed on: Jul 28, 2017]
(2) https://www.youtube.com/watch?v=enx8SYVgfd0   [Accessed on: Jul 28, 2017]
 (3) https://www.youtube.com/watch?v=vS31O3XfH_0   [Accessed on: Jul 28, 2017]

Subject Code: BTAS-17106
Subject Name: Engineering Physics Laboratory

Programme:	B.Tech	L : 0, T: 0, P: 2
Branch:	All Branches	Teaching hrs: = 20hr
Semester:	1/2	Credits: 1
Theory/Practical:	Practical	Percentage of Numerical / Design Problems: NA
Int. Max. Marks:	30	Duration of End Semester Exam (ESE) : 1 hr
Ext. Max. Marks:	20	Elective Status: Compulsory
Total Marks:	50	

Prerequisites: Knowledge of using vernier callipers and screw gauze.
Corequisites: Basic knowledge of Lasers and Optical Fibers.

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Understand the importance of least count of instruments and errors in measurements and their propagation in the calculated results.
CO2	Compare the quality of different lasers and their applications in different optical processes.
CO3	Find the losses taking place in optical fibers and understand the working of an optical communication system.
CO4	Control the motion of charged particle in external electric and magnetic fields and use this property for analyzing different ac and dc circuits.
CO5	Understand the minute details of optical phenomena like interference, diffraction and dispersion.
CO6	Study properties of different electric and magnetic materials like dielectric constant, polarizability, change in dimensions in external electric and magnetic fields.

BTAS-17106

Instructions: Each student has to perform at eight experiments from serial no. 2-8 the list given below, while activity at serial no. one is compulsory.
List of Experiments

S. No.	Experiment Name	Reference Unit of Theory Subject (BTAS-17102)
1	Basic knowledge of least count and error analysis.	General Physics
2	To find the divergence of given laser.	Unit 7
3	To study diffraction using laser beam and hence determine the grating element.	Unit 7
4	To study laser interference using Michelson's Interferometer and hence find the wavelength of laser light.	Unit 3, 7
5	To determine the numerical aperture of an optical fibre.	Unit 7, 8
6	To determine the attenuation coefficient of a given optical fibre.	Unit 7, 8
7	Introduction to spectrometer and its use to find the angle of prism.	Unit 7, Optics
8	To find the refractive index of a liquid.	Unit 7, Optics
9	To obtain the waveform of a given oscillator/A.C. Mains using CRO.	Unit 1,
10	To study B-H curve using CRO.	Unit 1, Magnetic materials
11	To find the velocity of ultrasonic waves in a given liquid.	General Physics
12	To find the dielectric constant and polarizability of a dielectric substance.	Unit 1

Reference Books
(1) B. Sc. Practical Physics, C. L. Arora, reprint, 2010, S. Chand & Co.
(2) A Course of experiments with He-Ne Laser, R. S. Sirohi, 1985, Wiley Eastern.
(3) Practical Physics, G. L. Squires, 4th edition, 2001, Cambridge University Press.

Subject Code: BTAS-17107
Subject Name: Business Communication and Presentation Skills Lab.

Programme:	B.Tech	**L :** 0, **T:** 0, **P:** 2
Branch:	All Branches	**Teaching hrs:** = 20hr
Semester:	1/2	**Credits:** 1
Theory/Practical:	Practical	**Percentage of Numerical / Design Problems:** NA
Int. Max. Marks:	30	**Duration of End Semester Exam (ESE) :** 1 hr
Ext. Max. Marks:	20	**Elective Status:** Compulsory
Total Marks:	50	

Prerequisites: Basics of Business communication and presentation skills.

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Acquire and apply Standard English sounds and pronunciation
CO2	Develop a knack for structured public talk, group discussion and job interviews.
CO3	Demonstrate fluency in speech in acceptable accent.
CO4	Receive and understand spoken material accurately.
CO5	Read and comprehend written text and express his understanding in written form.
CO6	Demonstrate skills of summarizing and paraphrasing in appropriate academic and professional situations.

BTAS-17107

Instructions: Each student has to perform allthe experiments from the list given below:

List of Experiments

S. No.	Experiment Name	Reference Unit of Theory Subject (BTAS-17103)
1	What are Listening Skills? Learn them by lisetining to recorded Talk and Participation in Conversation.	General
2	Write an essay on Basics of English Pronunciation.	General
3	Discuss the features of Paper reading.	General
4	Explain Oral presentation & Extempore.	Unit 7
5	What is the importance of Seminar Presentation?	Unit 7
6	Discuss the characteristics of Group Discussion.	Unit 5
7	Explain the importance of Mock Interview.	Unit 6
8	Explain the significance of Situational Dialogues and role-Play.	General

Reference Books
(1) Spoken Engkish, Bansal and Harrison, Ist Edition 2013, Orient Blackswan
(2) ''A Practical Course in English Pronunciation'' J.Sethi,   Kamlesh Sadanand & D. V. Jindal, Ist Edition 2004, Prentice Hall of India Pvt. Ltd. New Delhi.
(3) English Pronouncing Dictionary, Daniel Jones, 18th edition 2011, Cambridge University Press.
(4) Handbook of Practical communication, Chrissi Wright 1st edition, 2005, Jaico Publishing House, Mumbai.

E books and online learning materials
(1) Effective Communication Skills, Book Boon, 2010
http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf
[Accessed on: Aug 05, 2017]
(2) 50 Toughest Job Interview Questions, Richard Borne, Ist Edition 2017, Paradise Publishers
https://www.free-ebooks.net/ebook/50-Toughest-Job-Interview-Questions [Accessed on August 7, 2017]
(3) English Pronunciation in Use Intermediate, Mark Hancock, 2016
http://hancockmcdonald.com/books/titles/english-pronunciation-use-intermediate [Accessed on Aug 07, 2017]

Online Courses and Video Lectures:
(1) https://www.coursera.org/learn/wharton-communication-skills   [Accessed on Aug 05, 2017]
(2) http://freevideolectures.com/Course/3430/Communication-Skills   [Accessed on Aug 05, 2017]
(3) https://www.youtube.com/watch?v=zvu9SoCyDec [Accessed on Aug 07, 2017]

Subject Code: BTEE-17102

Subject Name: Basic Electrical Engineering Laboratory

Programme:	B. Tech	L: 0, T: 0, P:2
Branch:	All Branches	Teaching hrs: = 20hrs
Semester:	1/2	Credits: 1
Theory/Practical:	Practical	Percentage of Numerical/Design Problems: NA
Int. Max. Marks:	30	Duration of End Semester Exam(ESE): 1 hr
Ext. Max. Marks:	20	Elective Status: Compulsory
Total Marks:	50	

Prerequisites: Basic laws related to Electrostatics and Magneto-Statics, Basic Knowledge of Electric Circuits and magnetic circuits, semiconductor materials.

On completion of the course, the student will have the ability to:

CO#	Course Outcome
CO1	Recognize different electrical components like resistances, inductances, capacitances and their ratings.
CO2	Verify and interpret basic laws of electric circuits like Ohm's Law and Kirchhoff's Law and same are demonstrated in their field placements.
CO3	Design electric circuits and utilize electric instruments to perform experiments.
CO4	Detect ratings of commonly used house hold electrical appliances.
CO5	Impart practical knowledge of electric circuits components and instruments.
CO6	Determine efficiency and regulation of the transformer

BTEE-17102

Instructions: Each student has to perform at least ten experiments from the list given below

List of Experiments

S. No.	Experiment Name	Reference unit of Theory Subject (BTEE-17101)
1	To verify Ohms Law and its limitations.	UNIT I
2	To verify Kirchhoff's Laws.	UNIT I
3	To measure the resistance and inductance of a coil by ammeter-voltmeter method.	UNIT III
4	To find voltage-current relationship in an R-L series circuit and to determine the power factor of the circuit.	UNIT III
5	To verify the voltage and current relations in star and delta connected systems.	UNIT II
6	To measure power and power factor in a single-phase AC circuit.	UNIT III
7	To verify series and parallel resonance in AC circuits.	UNIT III
8	To observe the B-H loop of ferromagnetic core material on CRO.	UNIT I
9	To measure the minimum operating voltage, current drawn, power consumed, and the power factor of a fluorescent tube light.	UNIT III
10	To verify the rating of compact fluorescent lamp (CFL).	UNIT III
11	To perform open-and short circuit tests on a single phase transformer and calculate its efficiency.	UNIT IV
12	To start and reverse the direction of rotation of a)DC motor b) 3 Phase Induction motor	UNIT V
13	To Convert Voltmeter to ammeter & Vice Versa.	UNIT VI
14	To Study the use of multimeter.	UNIT VI
15	To analyze different connections of Single phase Induction motor.	UNIT V

Textbooks
(1) B.L. Theraja and A.K. Theraja *"A Textbook of Electrical Technology"*S. Chand Publishers.
(2) Vincent Del Toro, *"Electrical Engineering Fundamentals"*, PHI Learning Pvt Ltd.
(3) D.P.Kothari& I.J. Nagrath, *"Theory and Problems of Basic Electrical Engineering"*, PHI Learning Pvt Ltd.

Reference books
(1) V.K Mehta, *"Principles of Electrical Engineering"*,S.Chand Publishers.
(2) David V. Kerns, JR. J. David Irwin *"Essentials of Electrical and Computer Engineering",*Pearson Education.
(3) H. Cotton,*"Electrical Technology"*, CBS Publishers.

E-Books and Online Learning Material
(1) Basic Electrical Engineering, Abhijit Chakrabarti,Sudipta nath, Chandan Kumar Chanda , Tata Mc Graw Hill Publishing Company Limited, Edition 2009
https://books.google.co.in/books?isbn=0070669309
(2) Basic Electrical Engineering , C.L. Wadhwa, New Age International (P) Limited, 2006
https://books.google.co.in/books?isbn=8122417515
(3) *www.electrical4u.com*

Online Courses and Vedio Lectures
 (1) *https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC_ENGG*
https://www.youtube.com/results?search_query=basic+Electrical+engg+lectures

COURSE NAME: BASIC ELECTRONICS LAB

COURSE CODE: BTEC-17102

Credits: 1

Internal Marks: 30

L	T	P
-	-	2

External Marks: 20

Note: The evaluation of the Lab work shall be done as per the approved Rubrics.

Course Outcomes

On successful completion of this course, the students should be able to:

CO1: Comprehend the functions of Digital Multimeter, Function Generator and Cathode Ray Oscilloscope (CRO).

CO2: Analyse the V-I characteristics of P-N diode and Zener Diode.

CO3: Illustrate the operation of half-wave rectifier and full-wave rectifier with and without filter.

CO4: Illustrate the operation of BJT in Common Emitter Configuration and as an Oscillator.

CO5: Understand basic logic gates and Implement them using Universal Gates

CO6: Analyse the operation of Adder and Subtractor

CO7: Demonstrate various modulation techniques used in Communication

Contents

Exp 1: Measurement of Resistance, Voltage and Current using Digital Multimeter.

Exp 2: Generation of various wave shapes using Function Generator and displaying these on CRO.

Exp 3: To illustrate V-I Characteristics of P-N Junction Diode.

Exp 4: To illustrate the characteristics of Zener Diode.

Exp 5: To understand the operation of Half Wave and Full Wave Rectifier without Filter.

Exp 6: To understand the operation of Half Wave and Full Wave Rectifier with Filter.

Exp 7: To illustrate characteristics of BJT in Common Emitter Configuration.

Exp 8: To illustrate the operation of Common Emitter BJT Amplifier.

Exp 9: To illustrate the operation of Oscillator.

Exp 10: Verification of Truth Tables of Logic Gates.

Exp 11: Implementation of Basic Logic Gates using Universal Gates.

Exp 12: To demonstrate the operation of Digital Logic Adder and Subtractor.

Exp 13: Demonstration of Modulation Techniques.

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SS-D

Subject Name : Engineering Mathematics-II

Programme : B.Tech	**L :** 3, **T :** 2 , **P :** 0
Branch : All Branches	**Teaching hrs :=** 40 hr
Semester : 2	**Credits :** 4
Theory / Practical : Theory	**Percentage of Numericals /DesignProblems:** 90 %
Int.Max.Marks : 40	**Duration of End Semester Exam (ESE) :** 3 hr

Pre-requisites: Trigonometric formulas , methods of differentation , methods of integration , solution to first order ordinary differential equation- variable separable method to Homogeneous first order ordinary differential equations.

Additional Material Allowed in ESE : (i) Scientific Calculator (ii) Normal Distribution Table

On Completion of the course , the student will have the ability to :

CO #	Course Outcome
CO1	Understand the formation and solution of ordinary differential equations.
CO2	Identify linear differential equations of higher order with constant and variable coefficients and study several methods to solve them.
CO3	Apply ordinary differential equations to simple harmonic motion, electric circuits and rate of growth and decay.
CO4	Evaluate initial value problems numerically and several techniques of numerical integration.
CO5	Recognize discrete and continuous probability distributions and their solution.
CO6	Identify Laplace and inverse Laplace transforms of several known functions and use them for solving differential equations

PART-I

UNIT1: Ordinary Differential Equations of first order: [10 hours]

Exact Differential equations, Equations reducible to exact form by integrating factors;Equations of the first order and higher degree. Clairaut's equation. Leibnitz's linearequation and Bernoulli's equation.

UNIT 2: Solution of linear Ordinary Differential Equations of second and higher order
                                                                              [10 hours]

Methods of finding complementary functions and particular integrals. Special methods for finding particular integrals: Method of variation of parameters. Cauchy's homogeneous and Legendre's linear equation, Simultaneous linear equations with constant coefficients.

Applications to electric R-L-C circuits, Simple harmonic motion, Rate of growth and decay.

PART-II

UNIT 3:Probability distribution: [5 hours]

Random variable. Binomial, Poisson and Normal distribution.

UNIT 4: Numerical Integration and Solution of ordinary differential equations:

                                                                              [5 hours]

Trapezoidal rule, Simpson's rule(1/3, 3/8), Euler's method and modified Euler's method, Runge Kutta methods (1,2,3,4 order).

UNIT 5. Laplace Transforms: [10 hours]

Definition, Laplace transforms of various standard functions, properties of Laplace transforms, inverse Laplace transforms, transform of derivatives and integrals, Transform of multiplication and division by t, convolution theorem, Laplace transform of unit step function. Applications to solution of ordinary linear differential equations with constant coefficients.

Text Books

1. Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, Delhi.

2. Taneja, H. C., Engineering Mathematics, Volume-I & Volume-II, 1. K. Publisher.

Reference Books

1. Kreyszig,E., Advanced Engineering Mathematics, Eighth edition, John W iley.

2.Michael D. Greenberg., Advanced Engineering Mathematics, Second Edition, Pearson Education.

3. Peter. V. O'Nil, Advanced Engineering Mathematics, Wadsworth- Publishing Company.

4. Jain, R.K. and Iyengar, S.R.K., Advanced Engineering Mathematics, Narosa Publishing House, New Delhi.

5. Pipes, L.A. and Harvill, L.R., Applied Mathematics for Engineers and Physicists, McGraw Hill

6. Babu Ram, Advance Engineering Mathematics, Pearson Education.

7. Ramana B. V., Higher Engineering Mathematics, Tata McGraw Hill company.

8. Sastry S.S., Introductory Methods of Numerical Analysis, Prentice Hall (India), (2002), 3rd ed.

Subject Name : Engineering Chemistry

Programme : B.Tech	L : 3, T : 1 , P : 0
Branch : All Branches	Teaching hrs : 40 hr
Semester : 1/2	Credits : 3.5
Theory / Practical : Theory	Percentage of Numericals /DesignProblems: 30 %
Int.Max.Marks : 40	Duration of End Semester Exam (ESE) : 3 hr
Ext.Max. Marks: 60	Elective status: Compulsory
Total Marks: 100	

Prerequisites: Chemical formulas, periodic table, metal and non metals, terms related to concentration, oxidation, reduction concept, different types of chemical reactions, normality equation, thermodynamics , equilibrium, colligative properties.
Co-requisites : Knowledge of applying different concepts of physical chemistry in present context.

Additional Material Allowed in ESE : (i) Scientific Calculator (ii) Log Table

On Completion of the course , the student will have the ability to :

CO #	Course Outcome
CO1	Identify the structure of unknown compounds and select a polymer according to the requirement.
CO2	Explain disadvantages of hard water and different softening and purification techniques.
CO3	Explore the use of different types of fuels according to the requirement.
CO4	Interpret the phase diagram and use it in concepts of metallurgy.
CO5	Protect machines / metallic parts from corrosion by using preventive measures and controlling different factors.
CO6	Understand the concept of design and working of different types of cell.

BTAS-17105
PART-I

UNIT1: Molecular Spectroscopy :   [6 hours]

Introduction, Beer- Lambert Law, UV/Visible Spectroscopy : Introduction, Instrumentation, Principle/Electronic transition, Chromophore, Factors causing absorption and intensities shift, Frank-Condon Principle and Applications, IR Spectroscopy :Introduction, Instrumentation, Principle, Hooke's law, selection rule, Fundamental modes of vibrations and types, Factors affecting vibrational frequency and Applications.

UNIT 2: Fuels :   [5 hours]

Introduction, Classification of fuels, Comparison of solid , liquid and gaseous fuels, Characteristics of a good fuel, Calorific value, Theoretical determination of calorific value, Ultimate and Proximate Analysis, Petrol and diesel engines, Compression ratio, Knocking in both type of engines, Octane number, Leaded petrol, Cetane number, Alternative fuels(method of preparation and applications): Biodiesel, Power alcohol and Synthetic petrol.

UNIT 3: Water and its treatment: [6 hours]

Introduction, Hardness and Alkalinity of water, units and determination, Analysis and water quality parameters, Softening of water by lime-soda method, Ion-exchange method and Zeolite method, Boiler feed water: Specifications, Scale and sludge formation, Priming, foaming and Boiler corrosion ,Different methods for water purification and Desalination of Brackish water.

UNIT 4: Phase Rule: [5 hours]

Introduction, Phase, Component, Degree of freedom, Gibbs phase rule, phase diagrams of one component system – water system, Reduced phase rule, two component system – Lead-silver, Potassium iodide-water system and Colligative properties

PART-II

UNIT 5: Electrochemistry I :   [5 hours]

Introduction,Electrolytes and electrolysis, Specific, molar and equivalent conductivity of electrolytic solutions, Migration of ions , Kohlrausch's Law, Transport number; definition and determination by Hittorf's method and moving boundary method, Application of conductivity measurements, Conductometric titrations.

UNIT 6: Electrochemistry II :   [5 hours]

Introduction, Electrochemical cell, Difference from electrolytic cell, Measurement of electrode potential, Different types of electrodes, Electrochemical Series , Nernst equation and its applications, Different type of cells : Voltaic cell and Concentration cells, Cell notation, Calculation of thermodynamic functions from cell emf, Electrodes and potentiometry.

UNIT 7: Corrosion and its Prevention :   [4 hours]

Introduction ,Different types of corrosion- Wet and Dry corrosion, Mechanism of wet corrosion, Galvanic corrosion, Concentration cell corrosion, Differential aeration corrosion, Soil corrosion, Microbial corrosion, Water-line , Intergrannular and Stress corrosion, Galvanic series, Passivation, Factors affecting corrosion, Methods for corrosion prevention and control.

UNIT 8: Polymers :   [4 hours]

 Introduction, Classification of polymers according to: origin, nature of monomers and chain structure, their behaviour when heated, nature of polymerization, functionality and tacticity, Types of polymerization with their general mechanisms, Different examples of polymers with their industrial use, Molecular weight of polymers, Different types of average molecular weight: number, weight and viscosity av. molecular weight, PDI, Degree of polymerisation, Variation of polymer properties with molecular weight and degree of polymerisation, Conductive polymers, Biodegradable polymers and Inorganic polymers.

Text Books

1. Engineering Chemistry , A.P.K. Sodhi, 7th Ed., Modern Publishers,2016.
2. Engineering Chemistry, Ramesh, S. and Vairam S. 1stEd.Wiley India, 2012 .
3. Principles of Physical Chemistry, Puri, B.R., Sharma,L.R., and Pathania, M.S., Vishal Publishing Co. 2008.
4. Engineering Chemistry: Fundamentals and Applications,   Aggarwal, S., Cambridge University Press, 2015.

Reference Books

1. Physical Chemistry , P.W. Atkins, 8th Ed., Oxford University Press, 2006 (Indian Print).
2. Physical Chemistry , T. Engel & P. Reid, 1st ed., Pearson Education, 2006.
3. Physical Chemistry ,Castellan, 3rd Ed., Addison Wisley/Narosa, 1985 (Indian Print)
4. Physical Chemistry , G. M. Barrow, 6th Ed., New York, McGraw Hill, 1996.
5. Physical Chemistry , R. J. Silbey, R. A. Albert & Moungi G. Bawendi, 4th Ed., New York: John Wiley, 2005.

E books and online learning materials

1. Chemistry   for   Engineering   Students,   H..Brown,   Thompson. https://books.google.co.in/books?isbn=143904791X [Accessed on: Nov, 4, 2017]
2. Engineering   Chemistry   by   B.   Sivasankar ,   Tata   McGraw-Hill   Pub.   Co.   Ltd,   2008. https://books.google.co.in/books?isbn=007066932 [Accessed on: Nov, 4, 2017]
3. .https://www.studynama.com/.../450-Engineering-chemistry-pdf-ebook-lecture-notes-f...

Online Courses and Video Lectures:
1. https://www.youtube.com/results?search_query=video+lectures+on+engg+chemistry
2. https://www.youtube.com/results?search_query=electrochemistry+class+12+full+lectures
3. http://www.gurug.net Unit-1 Water Technology (Hardness,Types & Estimation by EDTA Method) - Chemistry.
4. https://www.youtube.com/watch?v=CWOJW4357Bg
5. https://www.youtube.com/watch?v=jRVg4ue-_lc

Subject Code: BTCS-17101
Subject Name: Fundamentals of Computer Programming and Information Technology

Programme: B.Tech	**L:** 3, **T**: 1, **P**: 0
Branch: All Branches	**Teaching hrs: =** 40 hrs
Semester: 1/2	**Credits:** 3.5
Theory/Practical: Theory	**Percentage of Numerical /Design Problems:** 40%
Int. Max Marks: 40	**Duration of End Semester Exam (ESE):** 3 hrs
Ext. Max. Marks: 60	**Elective Status:** Compulsory
Total Marks: 100	

Prerequisites: Basic knowledge of computer system.
Co-requisites: --

On Completion of the course, students will have the ability to:

CO#	Course Outcome
CO1	Identify and analyze the advantage, limitations, and applications of computer system.
CO2	Apply the knowledge of word processor, spreadsheet and presentation software for office applications.
CO3	Design and develop program framework using Program Design Tools like algorithms, flowchart and pseducode.
CO4	Apply the syntax of procedure oriented language for solving problems.
CO5	Make use of core concepts like arrays and strings, functions, structures and union and pointers for developing programs in procedure oriented language.
CO6	Understand the life-long learning concepts of programming language.

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PART-I

UNIT -1: INTRODUCTION TO COMPUTER SYSTEM [3 hours]

Introduction to computer hardware and software, Block diagram of a computer system and its working, Peripherals devices, Memories – RAM, ROM, cache, primary and secondary storage devices.

UNIT -2: COMPUTER SOFTWARE [4 hours]

Introduction to computer software, operating system, operating system types and functions, Introduction to different features of Word processors, Spread sheets and presentation software, Evolution of Internet, Applications and services of Internet.

UNIT -3: INTRODUCTION TO PROGRAMMING IN C [5 hours]

Program design tools – algorithms, flowcharts, pseudo code. Procedure oriented programming and its features. Introduction to C language, Structure of C program, Compiling and linking C program.

UNIT -4: DATA TYPES AND I/O OPERATIONS [4 hours]

Character Set, Keywords, Identifiers, Constants, Variables, Data types, Type Modifiers, Reading and writing operations, Formatted and unformatted input and output.

UNIT -5: OPERATORS AND EXPRESSIONS [3 hours]

Introduction, Arithmetic operators, Relational operators, Logical operators, Increment and decrement operators, Conditional operators, Bitwise operators, Special operators. Precedence and associativity of operators.

PART-II

UNIT -6: CONTROLSTATEMENTS [5 hours]

Decision making statements – *if*, *if else*, Nested *if else*, *if else* ladder, *switch*. Looping statements – *while*, *do while*, *for*. Branching statements – *goto*, *break* and *continue*.

UNIT -7: ARRAYS AND STRINGS [5 hours]

Introduction to arrays, Types of arrays, Declaration and initialization of one dimensional and two dimensional arrays, Introduction to strings, Declaring and initializing string variables, Reading and writing strings from terminal, String handling functions.

UNIT -8: FUNCTIONS [3 hours]

Introduction to functions and its types, Elements of user defined function – function declaration, functions definition, function calling. Call by value, Call by reference, Returning value from function, Recursion, Storage classes.

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UNIT -9: STRUCTURES AND UNION [3 hours]

Defining a structure, Declaring structure variables, Accessing structure members, Structure initialization, Operations on individual members, Unions.

UNIT -10: POINTERS [5 hours]

Understanding Pointers, Accessing address of a variable, Declaring pointer variables, Initialization of pointer variables, Accessing variable through pointer.

Text Books
(1) Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill.
(2) C Programming Language, Brain W. Kernighan and Dennis M.Ritchie, Prentice Hall.
(3) Spirit of C, Henry Mullish and Herbert L. Cooper, Jaico Publishing House.

Reference Books
(1) Programming with C, Byron S. Gottfried, Tata McGraw Hill.
(2) Let us C, Y.P. Kanetkar, BPB Publications.
(3) Computer Programming in C, V. Rajaraman, Prentice Hall India.

E books and online materials
(1) C programming tutorial mark burgess
 http://markburgess.org/CTutorial/C-Tut-4.02.pdf

Online Course and Video Lectures
(1) https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-2010/
(2) http://nptel.ac.in/courses/106105085/4

Engineering Drawing BTME-17101

L	T	P		Internal	External
1	4	0		40	60

Course Outcome:
At the end of the course, the student shall be able to
1. Grasp and understand various terms required in engineering drawing
2. Conceptualize, and deliver the fundamentals of engineering drawing for given application.
3. Apply rules and conventions as per International Standards for engineering drawing.
4. Learn and apply orthographic as well as Isometric projections as per engineering requirement.
5. Integrate ideas for offering efficient and effective solutions to the engineering problems.
6. Interpret the drawing in terms of engineering requirement

PART A

1. Introduction: Engineering Drawing/Technical Lettering, Visual Science, Drawing equipment and use of instruments, Conventional representation of lines as per IS Standards SP46:1988, Principles of Dimensioning.

2. Theory of Projections: Type of projections: Perspective, Orthographic and their basic principles, System of orthographic projection: in reference to quadrants and octants, illustration through simple problems of projection, Projection of points in quadrants and octants.

3. Projection of Lines: Concept of Line, True Length, True angle of inclination with HP, True angle of inclination with VP, Horizontal Trace, Vertical Trace, Line is parallel to both HP and VP, Line is contained by profile plane, Line is parallel to one plane and inclined to other plane, and inclined to both HP and VP by Rotation and Trapezoid methods only, Illustration through examples.

4. Projection of Planes: Difference between plane and lamina, Illustration through examples for Lamina is parallel to one and perpendicular to other, Lamina is perpendicular to one and inclined to other, Lamina is inclined to both reference planes.

PART B

5. Projection of Solids: Definition of solids, types of solids, and elements of solids, Projection of solids with its axis parallel to one and perpendicular to other, axis is parallel to one and inclined to other, axis is parallel to both HP and VP; axis is inclined to both HP and VP.

6. Section of Solids: Definition of Sectioning and its purpose, Types of sectional planes, Illustration through examples.

7. Development of Surfaces: Purpose of development, Parallel line and radial line Methods only, Illustration through examples.

8. Isometric Projections: Axonometric and their basic Principles, Isometric   projection, Difference between isometric projection and isometric drawing, Isometric projection of solids such as cube, prism, pyramid and cylinder etc.

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Suggested Readings / Books

1. Agrawal B and Agrawal C M, "Engineering Graphics", Tata McGraw Hill Publishing Company Limited, 1st Edition, 2008, New Delhi.

2. Gill P S, "Engineering Graphics and Drafting", S.K. Kataria and Sons, 1st Edition, 2000, New Delhi.

3. Bhatt N D amd Panchal V M, "Elementary Engineering Drawing-Plane and Solid Geometry", Charotar Publishing House, 37nd Edition, 1996, Anand.

4. Parthasarathy N S and Murali V, "Engineering Drawing", Oxford University Press, 1st Edition, 2016, New Delhi.

5. Bertoline G R , Wiebe E N, Miler G L L & Mother J L, "Technical Graphics Communication", Irwin McGraw Hill, 6th Edition, 2010, New York.

BTME-17102 Elements of Mechanical Engineering   L   T   P
                                                              3   1   0

Course Outcome:

After studying this course the students shall be able to:

1. Understand fundamental principles of thermodynamics, processes, their properties and engineering applications.
2. Identify, formulate and solve mathematical problems/equations related to various laws of thermodynamics.
3. Explain application and solve mathematical problems related to Gas Power Cycles.
4. Describe the working and applications of IC engines.
5. Understand engineering materials, their selection and properties.
6. Suggest engineering materials for various applications

PART-A

1. Basic Concepts of Thermodynamics (08)

Definition of thermodynamic: Need to study thermodynamics; Application areas of thermodynamic; Difference between Microscopic (Statistical) thermodynamics and Macroscopic (Classical) thermodynamics; Brief concept of continuum; **Thermodynamic System** : definition, types (Open, Closed and Isolated) and their examples; **Thermodynamic System Boundary** : definition, types and their examples; **Surroundings**; Control(fixed) mass and Control Volume concept and their example ; Thermodynamic State; **Thermodynamic Property**: definition, types citing their examples; condition for any quantity to be a property; State postulate; Thermodynamic equilibrium (which includes Thermal, Mechanical and Chemical equilibrium etc.); Thermodynamic path; **Thermodynamic process:** definition, **concept of reversible process**, quasi-static (or, quasi-equilibrium) process, irreversible process, conditions for reversibility and how these are met with, non-flow processes and flow processes, method of representation of reversible and irreversible process on property diagrams; Cyclic process; **Thermodynamic Cycle:** definition and its concept; Energy and its forms (microscopic and macroscopic); Physical insight to internal energy; Energy transfer across system boundary i.e. transient energies (heat and work); Difference between heat and work; Sign conventions for heat and work interactions; heat and work as path functions; Equality of Temperature and Zeroth law of Thermodynamics.

2. First Law of Thermodynamics and its applications (10)

Definition, essence and corollaries or consequences of first law of Thermodynamics; Expressions for First law of Thermodynamics for a control mass undergoing a Cycle and for process (i.e., a change in state of a control mass) ; Concept of Enthalpy and total energy and differentiation between the two – a thermodynamic property; Compressible and incompressible substances, Specific heats, Difference between Internal Energy and Enthalpy of compressible and incompressible substances; Representation of first law of thermodynamics as rate equation; Analysis of non-flow/ flow process for a control mass undergoing constant volume, constant pressure, constant temperature, adiabatic and polytropic processes; Free Expansion Process and its examples, its representation on Property diagram; Review of concepts of control volume; Expressions of first law of thermodynamics for a control volume (i.e. open system) ; Steady State Steady Flow process and its examples; First law analysis of Steady State Flow process e.g. isochoric, isobaric, isothermal, isentropic and polytropic process; Throttling process and its applications; Flow energy or inertial energy of flowing fluids or, Energy transport by mass; Application of Steady State Flow Energy Equation to various engineering devices.

3. Second Law of Thermodynamics (12)

Limitations of first law of thermodynamics; and how 2nd law is fully able to explain away and thus overcome those shortcomings of Ist law; Thermal Reservoirs, source and sink (Low temperature and high

temperatures); **Heat Engine, Heat Pump and Refrigerator**: definitions, working, efficiency/performance and their real life examples. Justification as to why the actual efficiency of Heat Pump and Refrigerator shall

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also be ≤ 100% though on the face of it seems to be more than 100%; Various statements of Second Law of Thermodynamics and their equivalence; Philosophy of Carnot cycle and its consequences viz. how each of the individual four processes constituting the cycle contribute in optimizing the output and efficiency of the cycle; **Carnot Engine, Carnot Refrigerator and Carnot Heat Pump:** definitions, working, efficiency/performance and Limitations of the cycle; Carnot theorem for heat engines, refrigerators and heat pumps; derivation of Carnot efficiency/COP (which seems to be more than 100%); Thermodynamic Temperature Scale; Clausius theorem and Inequality; Philosophy and concept of entropy; Entropy changes during various processes; Temperature - Entropy Chart and representation of various processes on it; Principle of Increase of Entropy; Applications of Entropy Principle; Quality of Energy viz. high and low grade energies; Degradation of Energy; Third Law of Thermodynamics.

PART-B
4. Gas Power Cycles (08)
Introduction; Concept and philosophy of Air Standard Cycle along with associated assumptions and advantages; Air Standard Efficiency; Nomenclature of reciprocating piston-cylinder arrangement with basic definitions such as swept volume, clearance volume, compression ratio, mean effective pressure etc; Otto Cycle (or constant volume heat addition cycle), Diesel cycle (or constant pressure heat addition cycle) and Dual cycle (Mixed or Composite or Limited Pressure cycle) with their representation on P-V and T-S charts, their Air-standard (thermal) Efficiencies, Comparison of Otto, Diesel and Dual cycle under some defined similar parametric conditions.

5. IC Engines (04)
Introduction to heat engines; Merits of I.C. Engines and their important applications, Classification and constructional features of I.C. Engines; working of two stroke and four stroke Petrol and Diesel engines and their comparison.

6. Engineering Materials (05)
Materials and Civilization, Materials and Engineering, Classification of Engineering Materials, Mechanical Properties of Materials: elasticity, plasticity, strength, ductility, brittleness, melleability, toughness, resilience, hardness, machinability, formability, weldability. Properties, Composition, and Industrial Applications of materials: metals (ferrous- cast iron, tool-steels, stainless steels and non ferrous- Aluminum, brass, bronze), polymers (natural and synthetic , thermoplastic and thermosetting), ceramics (glass, optical fibre glass, cements), composites (fibre reinforced, metal matrix), smart materials (piezoelectric, shape memory, thermochromic, photochromic, magnetorheological), Conductors, Semiconductors and insulators, Organic and Inorganic materials. Selection of materials for engineering applications.

Suggested Readings / Books
1. Nag P.K. "Engineering Thermodynamics", Tata McGraw Hill.
2. Yadav R., "Thermodynamics and Heat Engines", Central Publishing House, Allahabad.
3. Rogers G and Mayhew Y, "Engineering Thermodynamics", Pearson Education.
4. Rao Y.V.C, "An Introduction to Thermodynamics", New Age International (P) Limited Publishers.
5. Khanna O.P, "Material Science and Metallurgy", Dhanpat Rai Publications.

Subject Code : BTAS-17108

Subject Name : Engineering Chemistry Laboratory

Programme : B.Tech	**L : 0,** **T : 0 ,** **P : 2**
Branch : All Branches	**Teaching hrs :** 20 hr
Semester : 1/2	**Credits :** 1
Theory / Practical : Theory	**Percentage of Numericals /DesignProblems: NA**
Int. Max. Marks : 30	**Duration of End Semester Exam (ESE) :** 1 hr
Ext. Max. Marks: 20	**Elective status:** Compulsory
Total Marks: 50	

Prerequisites: Knowledge of glass apparatus to be used in lab. for volumetric analysis, handling of chemicals in lab., knowledge of molecular weight, equivalent weight, concentration expressions and normality equation
Co-requisites : Knowledge of calibration of instruments
Additional Material Allowed in ESE : (i) Scientific Calculator (ii) Log Table

On Completion of the course , the student will have the ability to :

CO #	Course Outcome
CO1	Correlate the impurities with hardness, chloride content and alkalinity of water.
CO2	Be able to select a lubricant for particular type of a machine and analyse the importance of temperature for viscosity.
CO3	Study different characters of fuels and select a fuel according to requirement.
CO4	Be able to handle sophisticated instruments to interpret the results to calculate other parameters.
CO5	Understand the advantages of chromatography.
CO6	Know to maintain different reaction conditions to get maximum yield of the product, if possible by green chemistry approach.

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Each student is required to perform two experiments from each of the 5 titles depending on his/her branch and aptitude.

Title1. Analysis of Effluents

S. No	Experiment Name	Reference Unit of Theory Subject
1	Determination of hardness of water by EDTA method	Unit III
2	Determination of chloride content in water	Unit III
3	Determination of alkalinity in water	Unit III
4	Determination of turbidity in water	Unit III

Title2. Analysis of Fuels and Lubricants

S. No	Experiment Name	Reference Unit of Theory Subject
1	Determination of absolute and relative viscosity	Unit II
2	Determination of acid value and aniline point of oil	Unit II
3	Determination of Flash and Fire Point	Unit II
4	Determination of moisture, volatile and Ash content by proximate analysis.	Unit II

Title3. Instrumental Analysis

S. No	Experiment Name	Reference Unit of Theory Subject
1	Determination of conc. of solution conductometrically	Unit V,VI
2	Determination of conc. of solution pH metrically	Unit V,VI
3	Determination of wavelength abs. and unknown conc. of solution.	Unit I
4	Determination of Surface Tension of a Liquid using Stalagmometer.	

Title 4. Synthesis and Green Chemistry Experiments

S. No	Experiment Name	Reference Unit of Theory Subject
1	Prepration of a polymer	Unit VIII
2	Prepration of aspirin	
3	Bas Catalysed aldol condensation	Unit VIII
4	Acetylation of primary amines using eco friendly method	

Title 5. Chromatography

S. No	Experiment Name	Reference Unit of Theory Subject
1	Seperation of ions by ion-exchange method.	Unit III
2	Separation of plant pigments by column chromatography	Unit III
3	Separation of metallic ions by paper chromatography method.	
4	Determination of Rf value of amino acids by TLC and identification of the amino acid present	Unit I

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Text Books:
Practical Engineering Chemistry , K. Mukkanti, B.S. Publications, 2009

Reference Books:
1. Experiments in Applied Chemistry, Sunita Rattan, S. K. Kataria &Sons, 2002.
2. Vogel's Textbook of Quantitative Chemical Analysis, Mendham et.al.,Pearson Education Ltd.,2006.

E books and online learning materials:
1. Text Book of engineering chemistry , R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.,2009
   https://www.bvrit.ac.in/...engineering_chemistry/Engineering%20Chemistry.pdf
2. www.vpkbiet.org/pdf/FE/Lab_Manual_Chem.pdf

Online Courses and Video Lectures
1. https://www.youtube.com/watch?v=O-MRC0dskHg
2. https://www.youtube.com/watch?v=vayqcY21ojQ
3. https://www.youtube.com/watch?v=FMFtVsPYAIY
4. https://www.youtube.com/watch?v=b1PbQ7jjVVM
5. https://www.youtube.com/watch?v=VzJ60uMdFe8
6. https://www.youtube.com/watch?v=amFOhvc6p74
7. https://www.youtube.com/watch?v=3Sd8D0SQ-8s
8. https://www.youtube.com/watch?v=f-oNngiG9ek
9. https://www.youtube.com/watch?v=ZCzgQXGz9Tg
10. https://www.youtube.com/watch?v=UmWMlKJAdSk

Subject Code: BTCS-17102
Subject Name: Fundamentals of Computer Programming and Information Technology Laboratory

Programme :	B.Tech	**L**: 0, **T**: 0, **P**:2	
Branch:	All Branches	**Teaching hrs: =** 20 hrs.	
Semester:	1/2	**Credits: 1**	
Theory/Practical:	Practical	**Percentage of Numerical/Design Problems:** N/A	
Int. Max Marks:	30	**Duration of End Semester Exam (ESE):** 1 hrs	
Ext. Max. Marks:	20	**Elective Status:** Compulsory	
Total Marks:	**50**		

Prerequisites: Basic knowledge of computer programming.

On Completion of the course, students will have the ability to:

CO#	Course Outcome
CO1	Understand the working of basic component of computer system and applications.
CO2	Demonstrate the knowledge of world processor spreadsheet and presentation software.
CO3	Design and develop the program by using design tools.
CO4	Design and develop the program by using core concepts like arrays and string, functions, structures and union and pointers of procedure oriented programming.
CO5	Apply and choose appropriate techniques and important aspect required to formulate the program in procedure oriented language.
CO6	Recognize and build the programs to solve the engineering problems.

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Instructions: Students are required to prepare a file containing lab exercises based on programming only, where as the oral examination will from the entire syllabus.

S. No.	Experiment Name	Ref. Unit of Theory Subject (BTCS- 17101)
1	Familiarization with the Computer System, Navigating with Window Explorer and Working with Control Panel, Exploring the Internet.	UNIT I
2	Familiarization with Word processors, and its features: creating, editing, printing and saving documents, spell check, tables, mail merge, print a document, etc.	UNIT II
3	Familiarization with spreadsheet and its features: create and save a workbook with single and/or multiple worksheets, insert and delete a row and/or column in a worksheet, apply operations on range of cells using built-in formulae, print a worksheet, import and export data to or from worksheet, etc.	UNIT II
4	Familiarization with presentation software and its features: create and save a new presentation, apply design templates to a presentation, preview and print a presentation, add clip art, chart, pictures and table in a slide, set animation, etc.	UNIT II
5	Write a program to convert temperature from degree centigrade to Fahrenheit.	UNIT III
6	Write a program to find the nature of the roots as well as value of the roots. However, in case of imaginary roots, find the real part and imaginary part separately.	UNIT IV
7	Write a program, which takes two integer operands and one operator form user, performs the operation and then prints the result. (Consider the operators +, -, ×, /, % and use switch statement). For example, the input should be in the form: 5 + 3 the output should come Result = 8	UNIT V
8	Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a program to generate the first n terms of the sequence. For example, for n = 8, the output should be 0 1 1 2 3 5 8 13.	UNIT VI
9	The number such as 1991 is a palindrome because it is same number when read forward or backward. Write a program to check whether the given number is palindrome or not.	UNIT VI
10	Write a program to swap numbers the concept of user defined function.	UNIT VIII
11	Write a program to enter the elements of one dimensional array by user and display it on screen.	UNIT VII
12	Write a program for addition of two matrix $A_{m \times n}$ by $B_{p \times q}$.	UNIT VII
13	Write a program to illustrate the concept of string handling functions.	UNIT VIII
14	Write a program to perform the addition and multiplication of two complex numbers using structures.	UNIT IX
15	Write a program using pointers to compute the sum of all elements stored in an	UNIT X

array.	

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Reference Books

 (1) Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill.
(2) C Programming Language, Brain W. Kernighan and Dennis M.Ritchie, Prentice Hall.
(3) Spirit of C, Henry Mullish and Herbert L. Cooper, Jaico Publishing House.
(4) Programming with C, Byron S. Gottfried, Tata McGraw Hill.