

## Applied Mathematics-I

1. Ordinary Differential Equations of first order: 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
2. Linear Ordinary Differential Equations of second & higher order: Solution of linear Ordinary Differential Equations of second and higher order; 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.
3. Probability distribution: Random variable. Binomial, Poisson and Normal distribution.
4. Numerical Integration and Solution of ordinary differential equations : 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).
5. Laplace Transforms: 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.

### Suggested Text Books:

Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, Delhi.  
Taneja, H. C., Engineering Mathematics, Volume-I & Volume-II, I. K. Publisher.

### Suggested Readings

1. Kreyszig, E., Advanced Engineering Mathematics, Eighth edition, John Wiley.
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

Dr

P. (Pragya)

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R. (Sukhinder Singh)

**Subject Code: BTAS-17102**  
**Subject Name: Engineering Physics**

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

<b>CO#</b>	<b>Course Outcome</b>
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<sub>2</sub> 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, 6<sup>th</sup> edition, Cengage Learning.
- (3) Principles of Engineering Physics (Vol I & II), M. N. Khan, S. Panigrahi, 1<sup>st</sup> edition, 2016, Cambridge University Press.
- (4) Engineering Physics, D. R. Joshi, 1<sup>st</sup> edition, second reprint, 2014, McGraw Hill.

**Reference Books**

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



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- (6) Material Science & Engineering, W. D. Callister, 7<sup>th</sup> edition, 2007, John Wiley & Sons.
- (7) Solid State Physics, D. Wei, 1<sup>st</sup> edition, 2008, Cengage Learning.
- (8) Introduction to Solids, L. V. Azároff, new edition, 2017, Tata McGraw Hill.
- (9) Introduction to Superconductivity, M. Tinkham, 2<sup>nd</sup> edition, 1996, Dover Publications.
- (10) Nanotechnology, R. Rakesh, 2<sup>nd</sup> edition, 2014, S. Chand Publishers.
- (11) Nanomaterials, A. K. Bandyopadhyay, 2<sup>nd</sup> edition, 2017, New Age International Ltd.
- (12) Lasers & Non-Linear Optics, B. B. Laud, 3<sup>rd</sup> edition, 2015, New Age International Ltd.
- (13) Lasers: Fundamentals & Applications, K. Thyagarajan, A. K. Ghatak, 2<sup>nd</sup> edition, 2010, Springer.
- (14) Fibre Optic Communication, J. C. Palais, 5<sup>th</sup> edition, 2011, Pearson India.

**E books and online learning materials**

- (1) Relativity: The Special and General Theory, A. Einstein, 1<sup>st</sup> 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](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**

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

<b>CO#</b>	<b>Course Outcome</b>
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, 16<sup>th</sup> reprint, 2010, McGraw Hill.

**Reference Books**

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

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- (6) Gartside's Model Business Letters & Other business Documents, Shirley Taylor, 1<sup>st</sup> 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](http://nptel.ac.in/reviewed_pdfs/109104031/lec1.pdf) [Aug 05, 2017]

**Online Courses and Video Lectures:**

- (1) <http://freevidelectures.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:

<b>CO</b>	<b>Definition</b>	<b>POs</b>	<b>PSOs</b>
CO1	Apply the knowledge of working principle of diode and transistor for utilization in different applications	1(H)	1(M)
CO2	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, 2<sup>nd</sup> 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, 4<sup>th</sup> 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, 4<sup>th</sup> edition.
3. NPTEL Course on: Basic Electronics and Lab  
[http:// nptel.ac.in/courses/122106025/](http://nptel.ac.in/courses/122106025/)



Subject Code: BTEE-17101

Subject Name: Basic Electrical Engineering

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

<b>CO#</b>	<b>Course Outcome</b>
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: INTRODUCTION TO 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, Thevenin'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 magnet moving coil and moving iron instruments.

**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.

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**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](http://www.electrical4u.com)

**Online Courses and Video Lectures**

- (1) [https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC\\_ENGG](https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC_ENGG)
- (2) [https://www.youtube.com/results?search\\_query=basic+Electrical+engg+lectures](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

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

<b>CO#</b>	<b>Course Outcome</b>
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, 2<sup>nd</sup> edition, 2001, Oxford University Press.
- (2) Human rights under International Law and Indian Law, S. K. Kapoor, 2002, 1<sup>st</sup> edition, 2002, Prentice Hall of India.
- (3) Indian Constitution, D. D. Basu, 3<sup>rd</sup> edition, 2015, Oxford University Press.
- (4) Human Values and Professional Ethics, R. R. Gaur, R. Sangal and G. P. Bagaria, 2<sup>nd</sup> edition, 2013, Excel Books.
- (5) Professional Ethics, R. Subramanian, 1<sup>st</sup> edition, 2013, Oxford University Press.

**Reference Books**

- (1) Ethics, W. K. Frankena, 1<sup>st</sup> 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, 6<sup>th</sup> 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.), 1<sup>st</sup> 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](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](https://www.youtube.com/watch?v=vS31O3Xfh_0) [Accessed on: Jul 28, 2017]

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

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

**Prerequisites:** Knowledge of using vernier callipers and screw gauge.

**Corequisites:** Basic knowledge of Lasers and Optical Fibers.

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

<b>CO#</b>	<b>Course Outcome</b>
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, 4<sup>th</sup> edition, 2001, Cambridge University Press.

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

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

**Prerequisites:** Basics of Business communication and presentation skills.

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

<b>CO#</b>	<b>Course Outcome</b>
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 all the 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 listening 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 English, Bansal and Harrison, 1st Edition 2013, Orient Blackswan
- (2) "A Practical Course in English Pronunciation" J. Sethi, Kamlesh Sadanand & D. V. Jindal, 1st Edition 2004, Prentice Hall of India Pvt. Ltd. New Delhi.
- (3) English Pronouncing Dictionary, Daniel Jones, 18<sup>th</sup> edition 2011, Cambridge University Press.
- (4) Handbook of Practical communication, Chrissi Wright 1<sup>st</sup> 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, 1st 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

<b>Programme:</b>	B. Tech	<b>L: 0, T: 0, P:2</b>
<b>Branch:</b>	All Branches	<b>Teaching hrs: = 20hrs</b>
<b>Semester:</b>	1/2	<b>Credits: 1</b>
<b>Theory/Practical:</b>	Practical	<b>Percentage of Numerical/Design Problems: NA</b>
<b>Int. Max. Marks:</b>	30	<b>Duration of End Semester Exam(ESE): 1 hr</b>
<b>Ext. Max. Marks:</b>	20	<b>Elective Status: Compulsory</b>
<b>Total Marks:</b>	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](http://www.electrical4u.com)

**Online Courses and Video Lectures**

- (1) [https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC\\_ENGG](https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC_ENGG)  
[https://www.youtube.com/results?search\\_query=basic+Electrical+engg+lectures](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**

**External Marks: 20**

**L T P**

**- - 2**

**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.

*SS-D*

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