

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai
Accredited by NAAC with 'A' Grade | Accredited by NBA (CSE, EEE, MECH, CIVIL, ECE, IT)
NAGAPATTINAM – 611 002



B.Tech. – Computer Science and Business System

Full Time Curriculum and Syllabus

First Year – First Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1901MA105	Discrete Mathematics	3	0	0	3	40	60	100
1901MA106	Probability and Statistics	3	0	0	3	40	60	100
1901GE102	Principles of Electrical Engineering	2	0	2	3	50	50	100
1901PH103	Fundamentals of Physics	2	0	2	3	50	50	100
1901EN101	Business Communication and Value Science - I	1	0	2	2	100	0	100
1901GE103	Fundamentals of Computer Science	3	0	4	5	50	50	100
	Induction Program (Non Credit)	0	0	0	0	100	0	100
Total		14	0	10	19	430	270	700

L – Lecture | T – Tutorial | P – Practical | C – Credit | CA – Continuous Assessment | ES – End Semester

1901MA105

DISCRETE MATHEMATICS

L	T	P	C
3	0	0	3

MODULE I BOOLEAN ALGEBRA

09 Hours

Propositions- Logical connectives-Compound propositions-Conditional and bi conditional propositions- Truth tables - Tautologie and Contradictions - Logical and equivalences and implications - De Morgan"s Laws- Normal forms-Principal conjunctive and disjunctive normal forms Rules of inference-Arguments-Validity of arguments - Karnaugh map.

MODULE II ABSTRACT ALGEBRA

09 Hours

Set Operations - Properties - Power set -Relations - Graph and matrix of a relation - Partial Ordering - Equivalence relations - Group - Ring – Field.

MODULE III COMBINATORICS

09 Hours

Basics of Counting-Counting arguments- Pigeonhole Principle-Permutations and Combinations- Recursion and recurrence relations-Generating Functions-Mathematical Induction- Inclusion -Exclusion.

MODULE IV CALCULUS

09 Hours

Limits of functions -Continuity -Derivatives: Derivatives -Differentiability - Rules - Properties - Differentiation of transcendental functions - Higher order derivatives - Implicit differentiation - Integration: Anti-derivatives - Riemann sum -Indefinite and Definite integration - Mean value theorem for definite integral - Fundamental theorem of calculus.

MODULE V MULTIPLE INTEGRALS

09 Hours

Double integration with constant and variable limits-Region of integration -Change the order of integration - Area as double integral in Cartesian coordinates - Triple integral in Cartesian coordinates

TOTAL: 45 HOURS

REFERENCES:

1. N. Herstein, Topics in Algebra, John Wiley and Sons, 2015
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publication, 2017
3. Gilbert Strang, Introduction to linear algebra, Fifth Edition, Wellesley Cambridge Press, 2017
4. Peter V. O"Neil, Advanced Engineering Mathematics, Seventh Edition, Thomson Learning, 2011

1901MA106

PROBABILITY AND STATISTICS

L	T	P	C
3	0	0	3

MODULE I PROBABILITY AND RANDOM VARIABLE

9 Hours

Probability: Concepts of experiments, Sample space, event - Combinatorial probability - Conditional probability - Baye's theorem. Random variable: Probability mass function - Probability density function Properties - Mathematical expectation and its properties-Moments and its properties - Moment generating functions.

MODULE II PROBABILITY DISTRIBUTIONS

9 Hours

Discrete Probability distributions: Binomial distribution -Poisson distribution - Geometric distribution. Continuous Probability distributions: Uniform distribution - Exponential distribution - Normal distribution.

MODULE III TWO DIMENSIONAL RANDOM VARIABLES

9 Hours

Joint Distribution - Discrete and continuous distributions - Marginal and Conditional Distributions - Correlation-Rank correlation - Linear Regression

MODULE IV INTRODUCTION TO STATISTICS

9 Hours

Definition of Statistics - Basic Objectives - Collection of Data - Population - Sample - Representative Sample - Classification and Tabulation of Univariate data - Graphical representation - Frequency curves - Central tendency and Dispersion - Applications.

MODULE V TESTING OF HYPOTHESIS

9 Hours

Sampling - Large sample test: Tests for Single mean- Test for difference between two means. Small sample test: Tests for mean (t test), F- test - Chi-square test for Goodness of fit and Independence of attributes.

TOTAL: 45 HOURS

REFERENCES:

1. S. M. Ross, Introduction of Probability Models, Academic Press, springer Publication, 2000
2. A. Goon, M. Gupta and B. Dasgupta, Fundamentals of Statistics, Vol. I & II, World Press, 2013
3. I. R. Miller, J.E. Freund and R. Johnson, "Probability and Statistics for Engineers". Fourth Edition, PHI, 2011.
4. A. M. Mood, F.A. Graybill and D.C. Boes, "Introduction to the Theory of Statistics", McGraw Hill Education, 2010.

1901GE102	PRINCIPLES OF ELECTRICAL ENGINEERING	L	T	P	C
		2	0	2	3

MODULE I INTRODUCTION

7 Hours

Concept of Potential difference, voltage, current, Fundamental linear passive and active elements to their functional current-voltage relation, Terminology and symbols in order to describe electric networks, Concept of work, power, energy and conversion of energy.

MODULE II DC CIRCUITS

10 Hours

Current-voltage relations of electric network by mathematical equations to analyse the network (Thevenin's theorem, Norton-s Theorem, Maximum Power Transfer theorem) voltage source and current sources, ideal and practical, Kirchhoff-s laws and applications to network solutions using mesh analysis, Simplifications of networks using series- parallel, Star/Delta transformation. Superposition theorem.

MODULE III AC CIRCUITS

9 Hours

AC waveform definitions, form factor, peak factor, study of R-L, R-C,RLC series circuit, R-L-C parallel circuit, phasor representation in polar and rectangular form, concept of impedance, admittance, active, reactive, apparent and complex power, power factor, 3 phase Balanced AC Circuits.

MODULE IV ELECTROSTATICS AND ELECTRO-MECHANICS

10 Hours

Electrostatic field, electric field intensity, electric field strength, absolute permittivity, relative permittivity, permittivity, capacitor composite, dielectric capacitors, capacitors in series& parallel, energy stored in capacitors, charging and discharging of capacitors, Electricity and Magnetism, magnetic field and faraday's law, self and mutual inductance, Ampere's law, Magnetic circuit, Single phase transformer, principle of operation, EMF equation, voltage ratio, current ratio, KVA rating, efficiency and regulation, Electromechanical energy conversion,

MODULE V MEASUREMENTS AND SENSORS

9 Hours

Introduction to measuring devices/sensors and transducers related to electrical signals, Elementary methods for the measurement of electrical quantities in DC and AC systems and their practical application. Electrical Wiring and Illumination system: Basic layout of distribution system, Types of Wiring System &Wiring Accessories, Necessity of earthing, Types of earthing, Different types of lamps (Incandescent, Fluorescent, Sodium Vapour, Mercury Vapour, Metal Halide, CFL, LED)

EXPERIMENT 1: Familiarization of electrical Elements, sources, measuring devices and transducers related to electrical circuits **4 hours**

EXPERIMENT 2: Determination of resistance temperature coefficient **4 hours**

EXPERIMENT 3: Verification of Network Theorem (Superposition, Thevenin, Norton, Maximum Power Transfer theorem) **4 hours**

EXPERIMENT 4: Simulation of R-L-C series circuits for $X_L > X_C$, $X_L < X_C$ **4 hours**

EXPERIMENT 5: Simulation of Time response of RC circuit **5 hours**

EXPERIMENT 6: Verification of relation in between voltage and current in three phase balanced star and delta connected loads. **4 hours**

EXPERIMENT 7: Demonstration of measurement of electrical quantities in DC and AC systems. **5 hours**

TOTAL: 75 HOURS

REFERENCES:

1. T. K. Nagsarkar and M. S. Sukhija, Basic of Electrical Engineering, Oxford University Press, 2011.
2. Smarjith Ghosh, Fundamentals of Electrical and Electronics Engineering, Prentice Hall (India) Pvt. Ltd., 2010
3. A. Sudhakar, Shyammohan S Palli, Circuits and Networks Analysis and Synthesis, Tata McGraw Hill, 2010
4. Muthusubramanian&Salivahanan, Basic Electrical and Electronics Engineering and Communication Engineering, Seventh Edition, Tata MCGraw Hill Education Private Limited, 2011
5. William H. Hayt, Jr. John A. Buck, Engineering Electromagnetics, McGraw Hill Higher Education, 8th revised Edition, 2011.
6. K. A. Gangadhar, P.M. Ramanathan, Electromagnetic Field Theory, Khanna Publishers, Sixteenth Edition, 2011

1901PH103	FUNDAMENTALS OF PHYSICS	L	T	P	C
		2	0	2	3

MODULE I OSCILLATIONS 9 Hours

Periodic motion-simple harmonic motion-characteristics of simple harmonic motion-vibration of simple springs mass system. Resonance-definition., damped harmonic oscillator - heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators

MODULE II CLASSICAL OPTICS 9 Hours

Theory of interference fringes-types of interference- Fresnel-s prism- Newton- rings, Diffraction-Two kinds of diffraction-Difference between interference and diffraction Fresnel's half period zone and zone plate-Fraunhofer diffraction at single slit-plane diffraction grating. Temporal and Spatial Coherence, Polarization - Concept of production of polarized beam of light from two SHM acting at right angle; plane, elliptical and circularly polarized light, Brewster's law, double refraction.

MODULE III QUANTUM PHYSICS 9 Hours

Dual nature of matter - development of quantum theory- de-Broglie wavelength - Schrodinger's wave equation: time dependent and time independent wave equations - physical significance of wave function - application: particle in one dimensional box.

MODULE IV CRYSTAL PHYSICS 9 Hours

Crystalline and amorphous materials - lattice - space lattice point - basis - MODULE cell - crystal systems - Bravais lattices - Miller indices - "d" spacing in cubic lattice - calculation of number of atoms per MODULE cell, atomic radius, coordination number and packing density for SC, BCC, FCC and HCP structures.

MODULE V MODERN OPTICS 9 Hours

Energy levels - Principle of laser - Characteristics of laser radiation -Einstein's coefficients- Population inversion - Optical pumping - Pumping mechanisms - Types of laser - CO2 laser - Homo junction GaAs laser. Fiber optics- Principle -Structure of an optical fiber- Types of optical fibers -Applications.

EXPERIMENT 1 Magnetic field along the axis of current carrying coil -Stewart and Gee **9 Hours**

EXPERIMENT 2 Determination of Hall coefficient of semi-conductor **9 Hours**

EXPERIMENT 3 Determination of Plank constant **9 Hours**

EXPERIMENT 4 Determination of wavelength of light by Laser diffraction method **9 Hours**

EXPERIMENT 5 Determination of wavelength of light by Newton's Ring method **9 Hours**

EXPERIMENT 6 Determination of laser and optical fiber parameters **9 Hours**

EXPERIMENT 7 Determination of Stefan's constant **9 Hours**

TOTAL: 75 HOURS

REFERENCES:

1. Basics of laser physics: for students of science and engineering <http://www.springer.com/978-3-319-50650-1> AjoyGhatak, Optics, 5th Ed., Tata McGraw Hill, 2012
2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, 6th Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014
3. B. K. Pandey and S. Chaturvedi, Engineering Physics, 1st edition, Cengage Learning India Pvt Ltd., New Delhi, 2017.
4. Halliday and Resnick, Fundamentals of Physics, 11 th edition, John Wiley and Sons, Inc, 2018

1901EN101	BUSINESS COMMUNICATION AND VALUE SCIENCE - I	L	T	P	C
		2	0	0	2

The course is a unified approach to enhance language skills of learners with an aim to hone their social skills and to increase their employability. The course is designed to acquaint the learners with the necessary LSRW (Listening/ Speaking / Reading/ Writing) skills needed either for recruitment or further studies abroad for which they attempt international exams like TOEFL, IELTS and GRE. It enables the learners improve their communication skills which are crucial in an academic environment as well as professional and personal lives. It aims to prepare students for careers requiring global business awareness and to develop skills required to work in internationally operating companies and organizations.

Course Objectives

- ✚ Understand what life skills are and their importance in leading a happy and well-adjusted life.
- ✚ Motivate students to look within and create a better version of self.
- ✚ Introduce them to key concepts of values, life skills and business communication.

COURSE CONTENTS

- ✚ Overview of the course with immersion activity.
- ✚ Overview of biz communication.
- ✚ Self-awareness, confidence and communication.
- ✚ Essentials of Business communication.
- ✚ Application of communication skills.
- ✚ Application of Life Skills.
- ✚ Assignment.

Module I:

6 hrs

Essential Grammar – I:

Refresher on Parts of Speech – Listen to an audio clip and note down the different parts of speech followed by discussion. Tenses-Applications of tenses in Functional Grammar (Take a quiz and then discuss) Sentence formation (general & Technical), Common errors, Voices. Show sequence from film where a character uses wrong sentence structure (e.g. Zindagi Na Milegi Dobara where the characters use ‘the’ before every.

Module II:

6 hrs

Listening Skills:

Law of nature- Importance of listening skills, Difference between listening and hearing, Types of listening, listen to recording and answer questions based on them.

Module III:

7 hrs

Speaking Skills:

Presentation on favorite cricket captain in IPL and the skills and values they demonstrate -
Overview of LOL (include activity on introducing self).- presentation on favorite cricket captain in IPL and the skills and values they demonstrate -
Record a conversation between a celebrity and an interviewer.

Module IV :

7 hrs

Communication Skills:

Over view of Communication Skills , Barriers of communication Skills, Effective Communication Skills - verbal and non – verbal, Pronunciation, clarity of speech skills, – Role, Importance of Questioning , Skit based on communication skills , Write a newspaper report on an IPL match.

Module V:

6 hrs

Recognize own strengths and opportunities:

Self-awareness – identity, body awareness, stress management

Expressing self, connecting with emotions, visualizing and experiencing purpose

TOTAL: 32 Hours

Course Outcomes

After completion of the course, the student will be able to

- Recognize the need for life skills and values: (U)
- Recognize own strengths and opportunities: (U)
- Apply the life skills to different situations: (AP)
- Understand the basic tenets of communication: (U)
- Apply the basic communication practices in different types of communication: (AP)

Text Book(s)

1. There are no prescribed texts for Semester 1 – there will be handouts and reference links shared.

References

1. English vocabulary in use – Alan Mc’Carthy and O’dell.
2. APAART: Speak Well 1 (English language and communication)
3. APAART: Speak Well 2 (Soft Skills)
4. Business Communication – Dr. Saroj Hiremath

Web References

1. Train your mind to perform under pressure- Simon sinek
<https://curiosity.com/videos/simon-sinek-on-training-your-mind-to-perform-under-pressure-capture-your-flag/>
2. Brilliant way one CEO rallied his team in the middle of layoffs
<https://www.inc.com/video/simon-sinek-explains-why-you-should-put-people-before-numbers.html>
3. Will Smith's Top Ten rules for success
<https://www.youtube.com/watch?v=bBsT9omTeh0>

Online Resources

1. <https://www.coursera.org/learn/learning-how-to-learn>
2. <https://www.coursera.org/specializations/effective-business-communication>

1901GE103	FUNDAMENTALS OF COMPUTER SCIENCE	L	T	P	C
		3	0	4	5

MODULE I GENERAL PROBLEM SOLVING CONCEPTS AND IMPERATIVE LANGUAGE 6 Hours

Algorithm, and Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops. Imperative languages: Introduction to imperative language; syntax and constructs of a specific language (ANSI C) .Types Operator and Expressions with discussion of variable naming and Hungarian Notation: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation

MODULE II CONTROL FLOW WITH DISCUSSION ON STRUCTURED AND UNSTRUCTURED PROGRAMMING 6 Hours

Statements and Blocks, If-Else-If, Switch, Loops - while, do, for, break and continue, Goto Labels, structured and un- structured programming.

MODULE III FUNCTIONS AND PROGRAM STRUCTURE WITH DISCUSSION ON STANDARD LIBRARY 6 Hours

Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Preprocessor, Standard Library Functions and return types.

MODULE IV POINTERS AND ARRAYS 6 Hours

Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional array and Row/column major formats, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.

MODULE V STRUCTURES 6 Hours

Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral Structures, Table look up, Typedef, Unions, Bit-fields Input and Output: Standard I/O, Formatted Output printf, Formated Input scanf, Variable length argument list, file access including FILE structure, fopen, stdin, stdout and stderr, Error Handling including exit, perror and error.h, Line I/O, related miscellaneous functions.

EXPERIMENT 1	Algorithm and flowcharts of small problems like GCD	3 Hours
EXPERIMENT 2	Structured code writing with C	3 Hours
EXPERIMENT 3	Small but tricky codes	3 Hours
EXPERIMENT 4	Proper parameter passing	3 Hours
EXPERIMENT 5	Command line Arguments	3 Hours
EXPERIMENT 6	Variables and parameter, Pointer to functions	3 Hours
EXPERIMENT 7	User defined headers, Make file utility	3 Hours
EXPERIMENT 8	Multi file program and user defined libraries	3 Hours
EXPERIMENT 9	Interesting substring matching / searching programs	3 Hours
EXPERIMENT 10	Parsing related assignments	3 Hours

TOTAL: 75 Hours

REFERENCES:

- 1.Herbert Schildt, C: The Complete Reference, Fourth Edition, McGraw Hill, 2017.
- 2.Yashavant Kanetkar, Let Us C, Sixteenth Edition, BPB Publications, 2017.
- 3.B. W. Kernighan and D. M. Ritchi, The C Programming Language, Second Edition, PHI, 1998
- 4.B. Gottfried, Programming in C, Third Edition, Schaum"s Outline Series, 2017.