

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOMOUS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA.

### **B.TECH.-FOOD TECHNOLOGY**

## I YEAR COURSE STRUCTURE & SYLLABI

		B.Tech I-I Semester						
S. No.	Code	Title	L/D	Т	Р	Credits		
1	23AHS01T	Communicative English	2	0	0	2		
2	23ABS04T	Fundamental Chemistry	3	0	0	3		
3	23ABS07	Matrices and Calculus	3	0	0	3		
4	23ACME01	Basic Civil & Mechanical Engineering	3	0	0	3		
5	23ACS01	Introduction to Programming	3	0	0	3		
6	23AHS01P	Communicative English Lab	0	0	2	1		
7	23ABS04P	Fundamental Chemistry	0	0	2	1		
8	23AME02	Engineering Workshop	0	0	3	1.5		
9	23ACS02	Computer Programming Lab	0	0	3	1.5		
10	23AHSS1	Health and wellness, Yoga and Sports	-	-	1	0.5		
Tota	<b>Total</b> 14 0 11 19.5							
		B.Tech I-II Semester						
1	23ABS01T	Engineering Physics	3	0	0	3		
2	23ABS08	Ordinary and Partial Differential Equations and Vector Calculus	3	0	0	3		
3	23ABEE01	Basic Electrical and Electronics Engineering	3	0	0	3		
4	23AME01	Engineering Graphics	1	0	4	3		
5	23ACS03	IT Workshop	0	0	2	1		
6	23AFT01T	Fundamentals of Food and Nutrition	3	0	0	3		
7	23ABS01P	Engineering Physics Lab	0	0	2	1		
8	23ABEE02	Electrical & Electronics Engineering Workshop	0	0	3	1.5		
9	23AFT01P	Fundamentals of Food And Nutrition Lab	0	0	3	1.5		
10	23AHSS2	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5		
	<b>Total</b> 13 0 15 20.5							



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# **B.TECH.-FOOD TECHNOLOGY (I-I SEMESTER)**

Course Code		т	T	п	C
22 A US01T	<b>COMMUNICATIVE ENGLISH</b>		I	Р	C
254115011	(Common to all Branches)	2	0	0	2
Semester	I B. Tech I Sem (EEE, CSE & FT) I B. Tech II Sem (CE, ME & I	ECE)			
Course Objective	s:				
<ul> <li>The main objective of introducing this course, communicative English, is to facilitate effective listening, Reading, Speaking and Writing skills among the students.</li> <li>It enhances the same in their comprehending abilities, oral presentations, reporting useful information and providing knowledge of grammatical structures and vocabulary.</li> <li>This course helps the students to make them effective in speaking and writing skills and to make them industry-ready.</li> </ul>					
Course Outcome	<b>G</b> (CO): Student will be able to				
CO1: Understand CO2: Applygram CO3: Analyzedisc CO4: Evaluaterea	<ul> <li>CO1: Understand the context, topic, and pieces of specific information from social or transactional dialogues.</li> <li>CO2: Applygrammaticalstructurestoformulatesentencesandcorrectwordforms.</li> <li>CO3: Analyzediscoursemarkerstospeakclearlyonaspecifictopicininformaldiscussions.</li> <li>CO4: Evaluatereading/listening_textsandto_write_summariesbased</li> </ul>				
onglobal	<b>c</b> omprehensionofthesetexts.				
UNIT I	Lesson:HUMANVALUES:GiftofMagi(ShortStory)				
Listening:					
Speaking:	dentifyingthetopic,thecontextandspecificpiecesofinformationbylisteningextsandansweringaseriesofquestions.	gtoshoi	taudio		
Reading:	Askingandansweringgeneralquestionsonfamiliartopicssuchashome,fami esandinterests; introducing oneselfand others. Skimming to get the main idea of a text; scanning to look for s	ly,worl pecific	k,stud pieces		
Writing:	ofinformation. Mechanics of Writing-Capitalization, Spellings, Pur	nctuatio	on-Parts	5	
Grammar: Vocabulary:	ofSentences. PartsofSpeech,BasicSentenceStructures-Forming questions Synonyms,Antonyms,Affixes(Prefixes/Suffixes),Rootwords.				
UNIT II	Lesson:NATURE: TheBrook byAlfredTennyson(Poem)				
Listening:	Answeringaseriesofquestionsaboutmainideasandsupportingideasafterlis	teningt	oaudio		
Speaking:	exts. Discussioninpairs/smallgroupsonspecifictopicsfollowedbyshortstructure	ed ta	lks.		
opening.	siscussioninpuns, sinungi oupsonspectitetopresiono wedby shortstructure	.u id			

D. Tech-FD I JN	TOACER(A) RZS REgulations
Reading:	Identifyingsequenceofideas; recognizing verbaltechniques that help to link the
	ideasinaparagraphtogether.
Writing:	Structure of a paragraph - Paragraph writing (specific topics)
Grammar:	Cohesivedevices-
linkers,useofa	ticlesandzeroarticle;prepositions.Vocabulary:
	Homonyms,Homophones,Homographs.
UNIT III	Lesson:BIOGRAPHY:ElonMusk
Listening:	Listeningfor globalcomprehensionandsummarizingwhatislistenedto.
Speaking:	Discussingspecifictopicsinpairs orsmall groups and reporting what is discussed
Reading:	Reading atextindetailbymakingbasicinferences-
	recognizing and interpreting specific context clues; strategies to use text clues for comprehent the set of
	sion.
Writing:	Summarizing,Note-making,paraphrasing
Grammar:	Verbs-tenses;subject-verbagreement;
Vocabulary:	Compoundwords, Collocations
	Lesson:INSPIRATION:TheToysofPeaceby Saki
Listening:Ma	king predictions while listening to conversations/ transactional dialogues
withoutvideo;l	isteningwithvideo.
Speaking:	Role plays for practice of conversational English in academic contexts
	(tormalandinformal)-askingforand givinginformation/directions.
Reading: Study	ying the use of graphic elements in texts to convey information, reveal
rends/patterns/rei	auonships, communicate processes of display complicateduala.
Crammari D	Cadeniic Withing Letter Withing, Report Withing, Creative Withing, Childar uninking)
Vocabulary	Porting veros, Directa indirects peech, Active & Passive voice
v ocabular y.	wordsortencomused, sargons
UNIT V	Lesson:MOTIVATION:ThePowerofIntrapersonalCommunication(AnEssay)
Listening:	Identifyingkeyterms,
	understandingconceptsandansweringaseriesofrelevantquestionsthattestcomprehension
Speaking	Formaloralprecentationsontonicsfromacademicsontexts
Deading:	Portingcomprehension
Reduing:	
writing:	Whitingstructuredessaysonspecifictopics.
Grammar:	EuliligShortlexts—
	identity inganucorrecting commoner for singrammarandus age (articles, prepositions, tens
Vocabulary	Tochnical Jargons
v ocabular y.	
Learning Reso	urces:
Textbooks:	
1. Pathfi	nder: <i>CommunicativeEnalishforUnderaraduateStudents</i> .1 <sup>st</sup> Edition.
Orient	BlackSwan.2023(Units 1.2&3)
2. Empor	wering withLanguage byCengagePublications,2023(Units4 &5)
Deference Bool	ZC•

- 1. Dubey, ShamJi&Co. EnglishforEngineers, VikasPublishers, 2020
- 2. Bailey, Stephen. *Academicwriting: AHandbook for International Students*. Routledge, 2014.
- 3. Murphy, Raymond. *EnglishGrammarinUse*, FourthEdition, CambridgeUniversityPress, 2019.
- 4. Lewis, Norman. WordPowerMadeEasy-
- The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014.

### Web Resources:

## GRAMMAR:

- 1. www.bbc.co.uk/learningenglish
- 2. https://dictionary.cambridge.org/grammar/british-grammar/
- 3. www.eslpod.com/index.html
- 4. https://www.learngrammar.net/
- 5. https://english4today.com/english-grammar-online-with-quizzes/
- 6. https://www.talkenglish.com/grammar/grammar.aspx

## VOCABULARY

- 1. https://www.youtube.com/c/DailyVideoVocabulary/videos
- 2. https://www.youtube.com/channel/UC4cmBAit8i\_NJZE8qK8sfpA



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Course Code		L	Т	Р	C	
23ABS02	23ABS02 FUNDAMENTAL CHEMISRTRY		0	0	3	
Semester	I B. Tech I Semester FOOD TECHNOLOGY	3	U	0	<u> </u>	
Course Objecti	ves:					
<ul> <li>To</li> <li>To</li> <li>To</li> </ul>	familiarizeengineeringanditsapplications trainthestudentsontheprinciplesandapplicationsofelectrochemistryand polymo introduceinstrumentalmethods,molecularmachinesandswitches	ers				
Course Outcom	<b>tes (CO):</b> Student will be able to					
<ul> <li>CO1: Comparethematerialsofconstructionforbatteryandelectrochemicalsensors.</li> <li>CO2: Explainthepreparation,propertiesandapplicationsofthermoplasticsand Thermosetting, elastomers and conducting polymers.</li> <li>CO3: Distinguishtheprinciplesofspectrometry,solidliquidchromatographyinseparation of solids and liquid mixtures.</li> </ul>						
Pre-requisite:	The basic knowledge of electrochemistry, polymers and surface chemistry.					
Unit - I	StructureandBondingModels					
Planck'squantumtheory, dual nature of matter, Schrodingerwave equation, significance of $\Psi$ and $\Psi^2$ , applications of hydrogen, Molecular orbital theory – bonding in homo-and heteronuclear diatomic molecules – energy laveldiagrams of $\Omega^2$ and						
Unit - II	ElectrochemistryandApplications					
Electrodes - reference electrodes (Standard hydrogen electrode Calomel electrode) electrochemical cell, Nernst equation, numerical problems based on cell potential calculations, P <sup>H</sup> meterandapplicationsof P <sup>H</sup> metry(acid-basetitrations), conductivity, conductivity cell, conductometric titrations (acid-base titrations). Electrochemicalsensors-potentiometersensors withexample.						
Primarycells - Z -workingprincip working and a	inc-airbattery,Secondarycells-Nickel-Cadmiumandlithium-ion batteries leofthebatteriesincludingcellreactions;Fuelcells -hydrogen-oxygenfuel cells oplications.	- bas	ic pri	nciple	<u>,</u>	
Unit - III	Polymer Chemistry					
Introductiontopolymers,functionalityofmonomers,chaingrowthandstepgrowth polymerization, with specific examples and mechanisms of polymer formation.						
Plastics-ThermoplasticsandThermosetting,Preparation,propertiesandapplicationsof PVC, Bakelite, Nylon6,6, carbon fibres. Elastomers- Buna-S, Buna-N - Preparation, properties and applications. Biodegradablepolymers:Polyβ-hydroxybutyrate-co-β-hydoxyvalerate(PHBV),poly hydroxyl butyrate (PHB) and applications						

Unit - IVInstrumental MethodsandApplicationsElectromagnetic spectrum, Absorption of radiation: Beer-Lamber's law, UV-Visible Spectroscopy, electronic<br/>transition, Instrumentation, IR spectroscopy, fundamental modes and selection rules, Instrumentation.<br/>Chromatography: Basic Principle-Classification of Chromatography-HPLC-<br/>Principle,Instrumentation,ThinLayerChromatography(TLC) and applications.

Unit - V SurfaceChemistryandNanomaterials

Introductiontosurfacechemistry,colloids,nanometalsandnanometaloxides,stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Langmuir). BET equation (no derivation) applications of colloids and nanomaterials - catalysis, medicine, sensors, etc.

#### **Learning Resources:**

#### **Textbooks:**

- 1. JainandJain,EngineeringChemistry,17E,DhanpatRai,2015.
- 2. PeterAtkins, Juliode Paulaand James Keeler, Atkins' Physical Chemistry, 10E, Oxford University Press, 2010.
- 3. GV Subba Reddy,KNJayaveera,CRamachandraiah, EngineeringChemistry,Mc Graw Hill, 2019.
- 4. ShikhaAgarwal,EngineeringChemistry:FundamentalsandApplications,2E, Cambridge University Press, 2019.

#### **Reference Books:**

- 1. SkoogandWest, Principles of Instrumental Analysis, 6E, Thomson, 2007.
- 2. DouglasA.Skoog,F.JamesHoller,Stanley R.Crouch,PrinciplesofInstrumental Analysis, 7E, Cengage, 2018.
- 3. D.J.Shaw, Introduction to colloids and Surface Chemistry, Butterworth-Heineman, 1992



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## (IB.Tech I Semester)

Course Code	MATRICES&CALCULUS	L	Т	Р	С	
23ABS07	MAIRICES&CALCULUS	3	0	0	3	
Semester	I B. Tech I Semester Food Technology		•			
Course Objecti	ves:					
<ul> <li>This course will illuminate the students in the concepts of calculus and linear algebra.</li> <li>To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real-world problems and their applications.</li> </ul>						
Course Outcon	<b>nes (CO):</b> Student will be able to					
<ul> <li>CO1:Develop the use of matrix algebra techniques that are needed by engineers for practical applications.</li> <li>CO2: Learn the concept of Eigen values and Eigen vectors and their applications in engineering field'</li> <li>CO3:Utilize the concept of mean value theorems to real life problems.</li> <li>CO4:Learn important tools of calculus in two and three dimensions.</li> <li>CO5: Familiar with double and triple integrals of functions of several variables in Cartesian coordinates.</li> </ul>						
Pre-requisite:	The basic knowledge of Matrices, Differentiation and Integration.					
Unit - I	MATRICES					
Definition- Typ system of non-	es of matrices. Elementary transformations, Rank of a matrix by echelon homogeneous and homogeneous linear equations by Gauss elimination meth	form, od.	, solut	ion o	f	
Unit - II	EIGENVALUES ANDEIGENVECTORS					
Eigenvalues and inverse of a ma	Eigenvectors of real matrices - properties, Cayley-Hamilton theorem (with atrix by Cayley - Hamilton theorem.	out pr	oof), f	indin	g	
Unit - III	MEAN VALUE THEOREMS (FUNCTIONS OF SINGLE VARIABLE	ES)				
Limit, Continu interpretation - standard functio	ity, Differentiability, Rolle's Theorem, Lagrange'smeanvaluetheoremwi Cauchy's mean value theorem, Taylor's and Maclaurin's series expansions ns	ththei (with	rgeon outpro	etrica oof) o	ıl f	
Unit - IV	MULTIVARIABLECALCULUS-PARTIALDIFFERENTIATION					
Functions of se Euler's theorem,	veral variables: Continuity and Differentiability, Partial derivatives, homo total derivatives, differentiation of an implicit function	geneo	us Fu	nctior	1S-	
Unit - V	MULTIVARIABLECALCULUS&MULTIPLEINTEGRALS					
Jacobian- properties and functional dependence, maxima and minima of functions of two variables, method of Lagrange multipliers. Evaluation of double and triple integrals in Cartesian form.						
Textbooks: HigherEngineer Reference Book	ingMathematics,B.S.Grewal,KhannaPublishers,2017, 44 <sup>th</sup> Edition					

- 4. Differential Calculus. Shanti Narayan, S. Chand and Co. Ltd., New Delhi, 2004.
- 5. Integral Calculus, Shanti Narayan, S. Chand and Co. Ltd. New Delhi, 2004.
- 6. AdvancedEngineeringMathematics,ErwinKreyszig,JohnWiley&Sons,2018,10<sup>th</sup>Edition.
- 7. Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
- 8. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha Science International Ltd., 2021 5<sup>th</sup> Edition (9th reprint).
- 9. Higher Engineering Mathematics, B. V. Ramana, McGraw Hill Education, 2017



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Course Code	Basic Civil And Mechanical Engineering	т	т	р	C
23ACME01	E01 (Common to All Branches of Engineering)		I	P	L
25/10/12/1		3	0	0	3
Semester	I B. Tech I Semester (EEE,CSE & FT)				
	Basic Civil Engineering				
Course Objectiv	/es:				
• Get fami	liarized with the scope and importance of Civil Engineering sub-divisions				
<ul> <li>Introduct</li> </ul>	tion to Basic Civil Engineering materials and construction techniques				
<ul> <li>Introduct</li> </ul>	e the preliminary concepts of Structural and Geotechnical Engineering, surve	eying,	Trans	sporta	tion
Engineer	ring and Environmental Engineering				_
<ul> <li>Get fam Waste w</li> </ul>	iliarized with the importance of quality, conveyance and storage of water, ater management.	qualit	y of v	vater	and
Course Outcom	<b>es (CO):</b> On completion of the course, the student should be able to:				
CO1: Understan	d various sub-divisions of Civil Engineering and to escalate their role in ensuri	ng be	ter so	ciety.	
CO2: Learn the	e basic characteristics of Civil Engineering Materials and attain knowled	lge o	n pref	fabrica	ated
technology.					
CO3: Know the	importance of structures and soils and learn the concepts of surveying				
CO4: Realize tl	ne importance of Transportation in nation's economy and the Engineering	meas	ures 1	related	l to
Transportation.					_
CO5: Comprehe	nd the importance of Water Storage, water quality and waste management for s	sustaiı	nable	growt	h
Unit - I	INTRODUCTION TO CIVIL ENGINEERING				
Role of Civil	Engineers in Society- Various Disciplines of Civil Engineering- Stru	lctura	l Eng	gineer	ing-
Geotechnical E	ngineering- Transportation Engineering- Hydraulics and Water Resou	rces	Engir	leerin	g -
Environmental E	ngineering -Scope of each discipline.				
Diapping Introdu	<b>Adterials:</b> Cement, Aggregates, Bricks, Cement concrete, Steel- Bullium	ig Co	nstruc	tion	anu
Fiaming-muou	STRUCTURAL AND GEOTECHNICAL ENGINEERING				
Unit - II	SURVEYING AND TRANSPORTATION ENGINEERING				
Structural and	<b>Geotechnical Engineering:</b> Introduction to types of Structures, Structural me	mber	and	Struct	ural
Components- Va	rious Forces acting on the structures				
Types of Soils a	nd foundations - Types of rocks and minerals - Soil formation, Classification	of so	ils- C	oncep	t of
permeability and	seepage				
Surveying and	Transportation Engineering: Objectives of Surveying- Horizontal Mea	asuren	nents-	Ang	ular
Measurements-	introduction to Bearings, Levelling instruments used for levelling -Simple p	robler	ns on	level	ling
and bearings-Co	ncept of Contour mapping.	_			
Importance of	Transportation in Nation's economic development- Types of Highway	Paven	ients-	Flex	ible
Pavements and F	Rigid Pavements-Basics of Harbour, Tunnel, Airport and Railway Engineering				
Unit - III	WATER RESOURCES ENGINEERING AND ENVIRONMENTAL EN	GINE	EERII	NG	
Water Resourc	es Engineering and Environmental Engineering: Introduction- Sources	of wa	ter- C	Quality	/ of
water- Specifica	tions- Introduction to Hydrology–Rainwater Harvesting- Water Storage and C	onvey	ance S	struct	ures
(Simple introduc	tion to Dams and Reservoirs).		) ev	П-	al -
Suctainability	Environmental Engineering- waste water Management- Importance of Red	uce, F	keuse,	кесу	cie-
SustamaDinty					

## Learning Resources:

## Textbooks:

- 1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
- 2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers.2022. First Edition.

3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

### **Reference Books:**

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. FifthEdition.

- 2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, KhannaPublishers, Delhi. 2016
- 3. G. S. Birdie, "Water supply and sanitary Engineering", Dhanpat Rai & Sons Publishers.
- 4. Bansal R. K, "Strength of Materials", Laxmi Publications, 2010.

5. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.

6. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

## <u>PART-B</u> Basic Mechanical Engineering

Course Objectives: The students after completing the course are expected to

- Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
- Explain different engineering materials and different manufacturing processes.
- Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

**Course Outcomes (CO):** On completion of the course, the student should be able to:

**CO1:** Understand the different manufacturing processes.

**CO2:** Explain the basics of thermal engineering and its applications.

**CO3:** Describe the working of different mechanical power transmission systems and power plants.

**CO4:** Describe the basics of robotics and its applications.

## Unit - I Introduction to Mechanical Engineering & Engineering Materials

**Introduction to Mechanical Engineering:** Role of Mechanical Engineering in Industries and Society-Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. **Engineering Materials** - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials.

### Unit - II Manufacturing Processes & Thermal Engineering

**Manufacturing Processes:** Principles of Casting, Forming and joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

**Thermal Engineering** –working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles, IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles.

## Unit - III Power plants, Mechanical Power Transmission & Introduction to Robotics

**Power plants**–working principle of Steam, Diesel, Hydro, Nuclear power plants.

**Mechanical Power Transmission** -Belt Drives, Chain, and Rope drives, Gear Drives and their applications. **Introduction to Robotics** -Joints & links, configurations, and applications of robotics

(Note: The subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject)

# Learning Resources:

Textbooks:

1. A Tear book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

2. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

3. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill

publications (India) Pvt. Ltd.

4. Basic Mechanical Engineering by Sadhu Signh, S. Chand Publications 2012.

## **Reference Books:**

- 1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.
- 2. AppuuKuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I
- 3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
- 4. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.



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Course Code	<b>INTRODUCTION TO PROGRAMMING</b> (Common to All branches of Engineering)	т	m	л	
	(Common to All branches of Engineering)	L	Ĩ	Р	C
23ACS01	(Common to An Dranches of Engineering)	3	0	0	3
					1

Semester	I Year B.Tech. – I Semester
Course Objecti	The main chiesting of the serves is to

**Course Objectives:** The main objective of the course is to

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects.

### **Course Outcomes:** After completion of the course, students will be able to

CO1: Understand basics of computers, the concept of algorithm and algorithmic thinking.

CO2: Analyse a problem and develop an algorithm to solve it.

CO3: Implement various algorithms using the C programming language.

CO4: Understand more advanced features of C language.

CO5: Develop problem-solving skills and the ability to debug and optimize the code

### Unit - I

### Introduction to Programming and Problem Solving

History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction to Programming Languages, Basics of a Computer Program- Algorithms, flowcharts (Using Dia Tool), pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting. Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Topdown approach, Bottom-up approach, Time and space complexities of algorithms.

### Unit - II

### Control Structures

Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, dowhile) Break and Continue.

### Unit - III

## Arrays and Strings

Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.

## Unit - IV

## **Pointers & User Defined Data types**

Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers, User-defined data types-Structures and Unions.

## Unit - V

## Functions & File Handling

Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, modifying parameters inside functions using pointers, arrays as parameters. Scope and Lifetime of Variables, Basics of File Handling

Note: The syllabus is designed with C Language as the fundamental language of implementation.

## Learning Resources:

## **Textbooks:**

- 1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, PrenticeHall, 1988
- 2. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

## **Reference Books:**

- 1. Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
- 2. Programming in C, Rema Theraja, Oxford, 2016, 2<sup>nd</sup> edition
- 3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3<sup>rd</sup> edition



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Course Code	COMMUNICATIVE ENGLISH LAB (Common to all Branches Of Engineering)	L	Т	Р	С			
23AHS01P								
25/110011		0	0	2	1			
Semester	Semester I B. Tech I Sem (EEE, CSE & FT) I B. Tech II Sem (CE, ME & ECE)							
Course Objectives:								
• Themainobjectiveofintroducingthiscourse, CommunicativeEnglishLaboratory, istoexpose the								

B. Tech P D JN TOACE (A) K25 Regulations
students to a variety of self-instructional, learner friendly modes of language learning.
<ul> <li>The students will get trained in the basic communication skills and also make them ready to</li> </ul>
facejobinterviews.
<b>Course Outcomes (CO):</b> Student will be able to
<b>CO1:</b> UnderstandthedifferentaspectsoftheEnglishlanguageproficiencywithemphasis <b>o</b> n LSRWskills.
<b>CO2:</b> Applycommunicationskillsthroughvarious languagelearningactivities.
<b>CO3:</b> AnalyzetheEnglishspeechsounds.stress.rhythm.intonationandsyllabledivision for
betterlisteningandspeakingcomprehension.
<b>CO4:</b> Evaluateandexhibitprofessionalisminparticipatingindebatesandgroundiscussions
CO5: Createeffectiveresumeandpreparethemselvestofaceinterviewsinfuture
List of Topics:
1. Vowels&Consonants
2 Neutralization/AccentBules/Syllable division
2. CommunicationSkills&IAM
4. DeleDlayer Conversational Practice
5. E mailWriting
5. E-IIIali wiliuig
6. Resume writing, Coverletter, SOP(Statement of Purpose)
/. GroupDiscussions-Methods& Practice
8. Debates-Methods&Practice
9. PPTPresentations/PosterPresentation
10. InterviewsSkills
SuggestedSefterere
Suggested Software:
WaldenInfotech
• YoungIndiaFilms
K-Van Solutions
References Books:
1. Raman Meenakshi, Sangeeta-Sharma. <i>TechnicalCommunication</i> . OxfordPress. 2018.
2. Taylor Grant : <i>EnglishConversationPractice</i> , TataMcGraw-HillEducationIndia, 2016
3. Hewing's, Martin. Cambridge Academic English (B2). CUP, 2012.
4. J.Sethi&P.V.Dhamija. A Course in Phonetics and Spoken English, (2ndEd)
Kindle, 2013
Web Resources:
SpokenEnglish:
1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.voutube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
10 https://www.youtube.com/c/SneakEnglishWithTiffani/nlavlists
11 https://www.youtube.com/channel/IICV1h_cBF0Drdy19akTM0WNw

# Voice&Accent:

1. https://www.youtube.com/user/letstalkaccent/videos

- 2. https://www.youtube.com/c/EngLanguageClub/featured
- 3. https://www.youtube.com/channel/UC\_OskgZBoS4dAnVUgJVexc
- 4. https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp\_IA



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B. TECH. FOOD TECHNOLOGY

Course Code		L	Т	Р	С		
23ABS02D	FUNDAMENTAL CHEMISRTRY LAB		L				
ZJAD302F		0	0	2	1		
Semester	I B. Tech I Semester FOOD TECHNOLOGY						
Course Objectives:							
Toverifythe fundamentalconcepts with experiments.							
<b>Course Outcomes (CO):</b> Student will be able to							

**CO1:** Determine the cell constant and conduct ance of solutions.

**CO2:** Prepareadvancedpolymermaterials.

**CO3:** Measurethestrength of an acidpresent insecondary batteries.

**CO4:** AnalyzetheIRspectraof someorganiccompounds.

List of Experiments

- 1. Measurementof10Dq byspectrophotometricmethod.
- 2. P<sup>H</sup>metrictitration of strongacid vs strongbase.
- 3. P<sup>H</sup>metrictitrationofweakacid vsstrongbase.
- 4. Conductometrictitrationofweak acidvsstrongbase.
- 5. Determination of cell constant and conductance of solutions.
- 6. Determination of Strengthofanacidin Pb-Acidbattery.
- 7. PreparationofBakelite.
- 8. Determination of Viscosity of polymersolution using viscometer.
- 9. VerificationofBeer-Lambert'sLaw.
- 10. SeparationofOrganicMixturesbyThinLayerChromatography.
- 11. IdentificationofsimpleorganiccompoundsbyIRspectroscopy.
- 12. Preparationofnanomaterials byprecipitation method.
- 13. Adsorptionofaceticacidbycharcoal.

### **Learning Resources:**

### **Reference Books:**

"Vogel'sQuantitativeChemicalAnalysis6<sup>th</sup>Edition"PearsonpublicationsbyJ. Mendham, R.C. Denney, J.D. Barnes and B. Sivasankar



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

# COLLEGE OF ENGINEERING (AUTONOMOUS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA.

# **B.TECH -FOOD TECHNOLOGY**

### (I B. Tech I Semester )

Cou	ırse Code	ENGINEERING WORKSHOP		L	Т	Р	С
23AME02	(Common to All Branches)		0	0	3	1.5	
Semester I B. Tech I Semester							
		Part A: Basic Electrical Engineering Workshop					

Course Objectives:
To familiarize students with wood working, sheet metal operations, fitting and electrical house wiring skills
<b>Course Outcomes (CO):</b> By the end of the course, the student will be able to:
<b>CO1:</b> Identify workshop tools and their operational capabilities.
<b>CO2:</b> Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and
welding.
<b>CO3:</b> Apply fitting operations in various applications.
<b>CO4:</b> Apply basic electrical engineering knowledge for House Wiring Practice
SYLLABUS
<b>1.Demonstration</b> : Safety practices and precautions to be observed in workshop.
 <b>2.Wood Working:</b> Familiarity with different types of woods and tools used in wood working and make following
joints.
a) Half – Lap joint b) Mortise and Ten on joint c) Corner Dovetail joint or Bridle joint
<b>3.Sheet Metal Working</b> : Familiarity with different types of tools used in sheet metal working, Developments of
following sheet metal job from GI sheets.
a) Tapered tray b) Conical funnel c) Elbow pipe d) Brazing
<b>4.Fitting:</b> Familiarity with different types of tools used in fitting and do the following fitting exercises.
a) V-fit b) Dovetail fit c) Semi-circular fit
d) Bicycle tire puncture and change of two-wheeler tyre
5.Electrical Wiring: Familiarity with different types of basic electrical circuits and make the following
connections.
a) Parallel and series b) Two-way switch c) God own lighting
d) Tube light e) Three phase motor f) Soldering of wires
<b>6.Foundry Trade:</b> Demonstration and practice on Moulding tools and processes,
Preparation of Green Sand Moulds for given Patterns.
<b>7.Welding Shop</b> : Demonstration and practice on Arc Welding and Gas welding.
Preparation of Lap joint and Butt joint.
<b>8.Plumbing:</b> Demonstration and practice of Plumbing tools.
Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters.
Learning Resources:
Text books:
1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published, 2019.
2. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.
3. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai &
Co., 2015 & 2017.
Reference Books:
1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and
Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul
Prakashan, 2021-22.
4. Balasubramanyam. N., Prof. Prasanthi. G., A Text Manual of Engineering Workshop Technology, Anchor
Academic Publishing, Hamburg, 2016.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B.TECH.- COMPUTER SCIENCE & ENGINEERING

Course Code	COMPUTER PROGRAMMING LAB	L	Т	Р	С
23ACS02	(Common to An Dranches of Engineering)	0	0 0	3	1.5
Semester	I Year B.Tech. – I Semester				

Course Objectives: The main objective of the course is to

The course aims to give students hands – on experience and train them on the concepts of the C-programming language

**Course Outcomes:** After completion of the course, students will be able to

CO1: Read, understand, and trace the execution of programs written in C language.

CO2: Select the right control structure for solving the problem.

CO3: Develop C programs which utilize memory efficiently using programming constructs like pointers. CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.

## Unit - I

# WEEK 1

**Objective:** Getting familiar with the programming environment on the computer and writing the first program.

# Suggested Experiments/Activities:

**Tutorial 1:** Problem-solving using Computers.

**Lab1:** Familiarization with programming environment

- i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.
- ii) Exposure to Turbo C, gcc
- iii) Writing simple programs using printf(), scanf()

# WEEK 2

**Objective:**Getting familiar with how to formally describe a solution to a problem in a series of finite steps both using textual notation and graphic notation.

# **Suggested Experiments /Activities:**

**Tutorial 2:** Problem-solving using Algorithms and Flow charts.

**Lab 1:** Converting algorithms/flow charts into C Source code.

Developing the algorithms/flowcharts for the following sample programs

i)Sum and average of 3 numbers

ii)Conversion of Fahrenheit to Celsius and vice versa

iii)Simple interest calculation

# WEEK 3

Objective: Learn how to define variables with the desired data-type, initialize them with appropriate values and how arithmetic operators can be used with variables and constants.

# Suggested Experiments/Activities:

**Tutorial 3:** Variable types and type conversions:

**Lab 3:** Simple computational problems using arithmetic expressions.

i)Finding the square root of a given number

ii)Finding compound interest

iii)Area of a triangle using heron's formulae

iv)Distance travelled by an object

# Unit - II

# WEEK 4

**Objective:** Explore the full scope of expressions, type-compatibility of variables & constants and operators used in the expression and how operator precedence works.

# Suggested Experiments/Activities:

**Tutorial4:** Operators and the precedence and as associativity:

Lab4: Simple computational problems using the operator' precedence and associativity

- i) Evaluate the following expressions.
  - a. A+B\*C+(D\*E) + F\*G
  - b. A/B\*C-B+A\*D/3
  - c. A+++B---A
  - d. J=(i++)+(++i)
- ii) Find the maximum of three numbers using conditional operator iii)Take marks of 5 subjects in integers, and find the total, average in float

# WEEK 5

**Objective:** Explore the full scope of different variants of "if construct" namely if-else, nullelse, if-else if\*-else, switch and nested-if including in what scenario each one of them can be used and how to use them. Explore all relational and logical operators while writing conditionals for "if construct".

# Suggested Experiments/Activities:

**Tutorial 5:** Branching and logical expressions:

**Lab 5**: Problems involving if-then-else structures.

- i) Write a C program to find the max and min of four numbers using if-else.
- ii) Write a C program to generate electricity bill.
- iii) Find the roots of the quadratic equation. iv)Write a C program to simulate a calculator using switch case.

v)Write a C program to find the given year is a leap year or not.

# WEEK 6

**Objective:** Explore the full scope of iterative constructs namely while loop, do-while loop and for loop in addition to structured jump constructs like break and continue including when each of these statements is more appropriate to use.

# Suggested Experiments/Activities:

**Tutorial 6:** Loops, while and for loops

Lab 6: Iterative problems e.g., the sum of series

- i) Find the factorial of given number using any loop.
- ii) Find the given number is a prime or not.
- iii) Compute sine and cos series

iv) Checking a number palindrome

v)Construct a pyramid of numbers.

# Unit - III

# WEEK 7:

**Objective:** Explore the full scope of Arrays construct namely defining and initializing 1-D and 2-D and more generically n-D arrays and referencing individual array elements from the defined array. Using integer 1-D arrays, explore search solution linear search.

# Suggested Experiments/Activities:

Tutorial 7: 1 D Arrays: searching.

Lab 7:1D Array manipulation, linear search

- i) Find the min and max of a 1-D integer array.
- ii) Perform linear search on1D array.
- iii) The reverse of a 1D integer array

iv)Find 2's complement of the given binary number.

v)Eliminate duplicate elements in an array.

# WEEK 8:

**Objective:** Explore the difference between other arrays and character arrays that can be used as Strings by using null character and get comfortable with string by doing experiments that will reverse a string and concatenate two strings. Explore sorting solution bubble sort using integer arrays.

# Suggested Experiments/Activities:

Tutorial 8: 2 D arrays, sorting and Strings.

Lab 8: Matrix problems, String operations, Bubble sort

i)Addition of two matrices

ii)Multiplication of two matrices

iii)Sort array elements using bubble sort

iv)Concatenate two strings without built-in functions

v)Reverse a string using built-in and without built-in string functions

# Unit - IV

# WEEK 9:

**Objective:** Explore pointers to manage a dynamic array of integers, including memory allocation & amp; value initialization, resizing changing and reordering the contents of an array and memory de-allocation using malloc (), calloc (), realloc () and free () functions. Gain experience processing command-line arguments received by C

# Suggested Experiments/Activities:

**Tutorial 9:** Pointers, structures and dynamic memory allocation

Lab 9: Pointers and structures, memory dereference.

- i) Write a C program to find the sum of a 1D array using malloc()
- ii) Write a C program to find the total, average of n students using structures
- iii)Enter n students data using calloc() and display failed students list
- iv) Read student name and marks from the command line and display the student details along with the total.
- v) Write a C program to implement realloc()

# WEEK 10:

**Objective:** Experiment with C Structures, Unions, bit fields and self-referential structures (Singly linked lists) and nested structures

# Suggested Experiments/Activities:

Tutorial 10: Bitfields, Self-Referential Structures, Linked lists

Lab10 : Bitfields, linked lists

Read and print a date using dd/mm/yyyy format using bit-fields and differentiate the same without using bit-fields

- i) Create and display a singly linked list using self-referential structure.
- ii) Demonstrate the differences between structures and unions using a C program. iii)Write a C program to shift/rotate using bitfields.

iv)Write a C program to copy one structure variable to another structure of the same type.

# Unit - V

**WEEK 11:** 

**Objective:** Explore the Functions, sub-routines, scope and extent of variables, doing some experiments by parameter passing using call by value. Basic methods of numerical integration

# Suggested Experiments/Activities:

**Tutorial 11:** Functions, call by value, scope and extent,

Lab 11: Simple functions using call by value, solving differential equations using Eulers theorem.

- i) Write a C function to calculate NCR value.
- ii) Write a C function to find the length of a string. iii)Write a C function to transpose of a matrix.

iv)Write a C function to demonstrate numerical integration of differential equations using Euler's method

# WEEK 12:

**Objective:** Explore how recursive solutions can be programmed by writing recursive functions that can be invoked from the main by programming at-least five distinct problems that have naturally recursive solutions.

# Suggested Experiments/Activities:

Tutorial 12: Recursion, the structure of recursive calls

Lab 12: Recursive functions

i)Write a recursive function to generate Fibonacci series.

ii)Write a recursive function to find the lcm of two numbers.

iii) Write a recursive function to find the factorial of a number.

iv)Write a C Program to implement Ackermann function using recursion.

v)Write a recursive function to find the sum of series.

# WEEK 13:

**Objective:** Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers

# Suggested Experiments/Activities:

Tutorial 13: Call by reference, dangling pointers

Lab 13: Simple functions using Call by reference, Dangling pointers.

- i) Write a C program to swap two numbers using call by reference.
- ii) Demonstrate Dangling pointer problem using a C program.
- iii) Write a C program to copy one string into another using pointer.

iv)Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

# WEEK14:

**Objective:** To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.

# Suggested Experiments/Activities:

Tutorial 14: File handling

Lab 14: File operations

- i) Write a C program to write and read text into a file.
- ii) Write a C program to write and read text into a binary file using fread() and fwrite()
- iii) Copy the contents of one file to another file.
- iv) Write a C program to merge two files into the third file using command-line arguments.
- v) Find no. of lines, words and characters in a file

vi)Write a C program to print last n characters of a given file.

## Learning Resources:

### **Textbooks:**

- 1. Ajay Mittal, Programming in C: A practical approach, Pearson.
- 2. Byron Gottfried, Schaum' s Outline of Programming with C, McGraw Hill

## **Reference Books:**

- 1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice- Hall of India
- 2. C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE



### **B.TECH.-FOOD TECHNOLOGY** L T P C

### Health and Wellness/ Yoga and Sports/Taekwondo 0000.5 (CommontoAllbranchesofEngineering)

#### **CourseObjectives:**

The main objective of introducing this course is to make the students maintain their mental and physical wellness by balancing emotions in their life. It mainly enhances the essential traits required for development of the personality.

#### CourseOutcomes: Aftercompletionof the course the student will be able to

CO1: Understand the importance of yoga and sports for Physicalfitness and sound health

CO2: Demonstrate an understanding of health-related fitness components

**CO3:** Compare and contrast various activities that help enhance their health

**CO4:** Assess current personal fitness levels.

CO5: DevelopPositivePersonality

#### **SYLLABUS**

#### UNITI

#### Conceptof

health and fitness, Nutrition and Balanced diet, basic concept of immunity Relationship between diet and fitness, Globalization and its impact on health, Body Mass Index (BMI) of all age groups.

#### Activities:

- i) Organizinghealthawarenessprogrammesincommunity
- ii) Preparationofhealthprofile
- iii) Preparationofchartfor balanceddietfor allagegroups

#### UNITII

Conceptofyoga,needforandimportanceofyoga,originandhistoryofyogainIndiancontext,classification of yoga, Physiological effects of Asanas- Pranayama and meditation, stressmanagementandyoga,Mentalhealthandyogapractice.

#### Activities:

Yogapractices–Asana,Kriya,Mudra,Bandha,Dhyana,SuryaNamaskar

#### UNITIII

Concept of Sports and fitness, importance, fitness components, history of sports, Ancient andModernOlympics,Asiangames andCommonwealthgames.

Activities:

- i) Participation in one major game and one individual sport viz., Athletics, Volleyball,Basketball, Handball, Football, Badminton, Kabaddi, Kho-kho, Table tennis, Cricketetc. Practicinggeneraland specificwarmup,aerobics
- ii) Practicing cardiorespiratory fitness, treadmill,run test,9 min walk,skipping andrunning.

### Reference Books :

- 1. <u>Gordon Edlin, Eric Golanty</u>. *Health and Wellness*, 14<sup>th</sup>Edn. Jones & Bartlett Learning, 2022
- 2. T.K.V.Desikachar. The Heart of Yoga: Developing a Personal Practice
- 3. Archie J.Bahm. Yoga Sutras of Patanjali, Jain Publishing Company, 1993
- **4.** Wiseman, John Lofty,*SAS Survival Handbook: The Ultimate Guide to Surviving Anywhere* Third Edition, William Morrow Paperbacks, 2014
  - 5. The Sports Rules Book/ Human Kinetics with Thomas Hanlon. -- 3rd ed. Human Kinetics, Inc.2014

### GeneralGuidelines:

- $\label{eq:linear} \textbf{1.} Institutes must assign slots in the Timetable for the activities of Health/Sports/Yoga.$
- **2.** Institutesmustprovidefield/facilityandoffer theminimumoffivechoicesofas manyasGames/Sports.
- **3.** Institutes are required to provide sports instructor/yogate a chertoment or the students.

### **EvaluationGuidelines:**

Evaluated foratotalof100marks.

A student can select 6 activities of his/her choice with a minimum of 01 activity perunit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalingto90marks. Astudentshallbeevaluatedbytheconcernedteacher for 10 marksbyconducting vivavoceonthesubject.



Course Code	ENGINEERING PHYSICS	L	т	Р	С	
23ABS01T	(Common to all Branches)	2	0	0	3	
Semester	I B. Tech I Sem (CE,ME & ECE) I B. Tech II Sem (EEE,CSE & FT)	<u> </u>	0	U	<u> </u>	
Course Objecti	ves:					
To bridge the g importance of arrangement of introduce novel-	To bridge the gap between the physics in previous and present UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction polarisation, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics with free electron theory , introduce povel concepts of dielectric and magnetic materials along with physics of semiconductors					
Course Outcon	<b>nes (CO):</b> Student will be able to					
CO1: Analyze t CO2: Familiariz CO3: Summariz CO4: Explain th role of fre CO5: Identify th	he intensity variation of light due to polarization, interference and diffraction. ze with the basics of crystals and their structure identification.(L2, L3, L4) ze various types of polarization of dielectrics and classify the magnetic materia ne fundamentals of quantum mechanics and identify the application of quantu ee electron theory in understanding the electrical conductivity in metals. (L2) ne type of semiconductor using Hall effect(L2)	(L2, als. (L m me	L3, L 2, L3 chanic	4) ) cs and	the	
UNIT I	WAV E OPTICS					
index. Diffraction: Intr slit & N-slits (Q Polarization: Int Nicol's Prism -F	oduction - Fresnel and Fraunhofer diffractions - Fraunhofer diffraction due qualitative) – Diffraction Grating - Dispersive power and resolving power of G troduction -Types of polarization - Polarization by reflection, refraction and Half wave and Quarter wave plates.	to sin Gratin I Dou	gle sl g (Qu ble re	it, dou alitati fractio	uble ve). on -	
UNIT II	CRYSTALLOGRAPHY AND X-RAY DIFFRACTION					
Crystallography coordination nur planes. X-ray diffractio methods	Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes. X-ray diffraction: Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods					
UNIT III	DIELECTRIC AND MAGNETIC MATERIALS					
Dielectric Materials: Introduction - Dielectric polarization - Dielectric polarizability, Susceptibility, Dielectric constant and Displacement Vector – Relation between the electric vectors - Types of polarizations- Electronic (Quantitative), Ionic (Quantitative) and Orientation polarizations (Qualitative) - Lorentz internal field - Clausius-Mossotti equation - complex dielectric constant – Frequency dependence of polarization – dielectric loss Magnetic Materials: Introduction - Magnetic dipole moment - Magnetization-Magnetic susceptibility and permeability – Atomic origin of magnetism - Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Domain concept for Ferromagnetism & Domain walls (Qualitative) - Hysteresis - soft						
and hard magne	UC MATERIALS.					
Quantum Mech	anics: Dual nature of matter - Heisenberg's Uncertainty Drinciple Signification	nce ar	nd pro	nertio	s of	
Quantum Mechanics. Dual nature of matter – neisenberg's oncertainty Principle – Significance and properties of						

wave function – Schrodinger's time independent and dependent wave equations– Particle in a one-dimensional infinite potential well.

Free Electron Theory: Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory – electrical conductivity based on quantum free electron theory - Fermi-Dirac distribution - Density of states - Fermi energy

### UNIT V SEMICONDUCTORS

Semiconductors: Formation of energy bands – classification of crystalline solids - Intrinsic semiconductors: Density of charge carriers – Electrical conductivity - Fermi level – Extrinsic semiconductors: density of charge carriers – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications.

### **Learning Resources:**

**Textbooks:** 

- 1. A Text book of Engineering Physics, M. N. Avadhanulu, P.G.Kshirsagar& TVS Arun Murthy, S. Chand Publications, 11th Edition 2019.
- 2. Engineering Physics D. K. Bhattacharya and Poonam Tandon, Oxford press (2015)

### **Reference Books:**

- 1. Engineering Physics B.K. Pandey and S. Chaturvedi, Cengage Learning 2021.
- 2. Engineering Physics Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
- 3. Engineering Physics" Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press. 2010
- 4. Engineering Physics M.R. Srinivasan, New Age international publishers (2009).

### Web Resources:

https://www.loc.gov/rr/scitech/selected-internet/physics.html



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B. TECH. FOOD TECHNOLOGY

Course Code	ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS AND	L	Т	Р	С
	VECTOR CALCULUS				
23AD500		3	0	0	3

Semester	I B. Tech II Semester Food Technology				
Course Objecti	ves:				
<ul> <li>Toenlight</li> <li>Tofurnist</li> <li>levelby</li> </ul>	htenthe learners in the conceptof differential equations andmulti variable calculus. Shthelearnerswithbasicconceptsandtechniquesatplustwoleveltolead theminto advanced handlingvariousrealworldapplications.				
Course Outcom	tes (CO): Student will be able to				
CO1: Learn the	concepts of mathematical modelling and converting the real world problem into a differential				
equation and sol	ve it.				
<b>CO2:</b> Solve the	differential equations related to various engineering fields (L6)				
CO3: Identify so	<b>CO3:</b> Identify solution methods for partial differential equations that model physical processes (L3)				
<b>CO5:</b> Estimate t	he work done against a field, circulation and flux using vector calculus (L6)				
Pre-requisite:	Differential and Integral Calculus.				
Unit - I	DIFFERENTIAL EQUATIONS				
Definition-order differential equa Law of cooling -	-degree-formation of a differential equation. Solutions of first order and first degree ordinary tions by separation of variables method, linear and Bernoulli's differential equations. Newton's – Law of natural growth and decay				
	LINEARDIFFERENTIALEQUATIONSOFHIGHER ORDER(CONSTANT				
Unit - 11	COEFFICIENTS)				
Definitions,hom	Definitions, homogenous and non-homogenous, complementary function, general solution, particular integral,				
Wronskian, met	Wronskian, method of variation of parameters.				
Unit - III	PARTIALDIFFERENTIALEQUATIONS				
Introduction ar	nd formation of Partial Differential Equations by elimination of arbitrary constants				
andarbitraryfunc	tions, solutions of first order equations using Lagrange's method.				
Unit - IV	VECTORDIFFERENTIATION				
Scalar and vector psychical interpretations a	or point functions, vector operator del, del applies to scalar point functions-Gradient and its pretation, del applied to vector point functions-Divergence and Curl and their psychical nd related properties.				
Unit - V	VECTORINTEGRATION				
Lineintegral-circ	culation-workdone, surface integral-flux, Green's theorem intheplane (without Proof), Stock's				
Theorem (witho	utproof). volumeintegral,Divergencetheorem(withoutproof)and relatedproblems.				
Learning Resou	irces:				
Textbooks:	a sMathematics D.C. Consult Khanna Dahlishana 2017, 44th Edition				
	mgwiauiemaucs, D. J. Grewai, Mianna Publishers, 2017, 44°° Eulfion				
1. Advance	dEngineeringMathematics, ErwinKrevszig, JohnWilev&Sons, 2018, 10 <sup>th</sup> Edition				
2. Thomas	Calculus, GeorgeB.Thomas, MauriceD.WeirandJoelHass, PearsonPublishers, 2018, 14 <sup>th</sup> Edition.				
3. Advance	dEngineeringMathematics, DennisG.ZillandWarrenS.Wright,JonesandBartlett,2018.				
4. Advance	dModernEngineeringMathematics, GlynJames, Pearsonpublishers, 2018, 5 <sup>th</sup> Edition.				
5. Advance	dEngineeringMathematics,R.K.JainandS.R.K.Iyengar,AlphaScienceInternationalLtd.,2021 5 <sup>th</sup>				
	20				

Edition(9th reprint).



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B.TECH -FOOD TECHNOLOGY (I B. Tech II Semester )

<b>Course Code</b>	<b>Basic Electrical &amp; Electronics Engineering</b>	т	m	л	C
	Part A: Basic Electrical Engineering	L		Р	
23ABEE01	(Common to All Branches)	3	0	0	3
Semester	I B. Tech I Semester (CE,ME& ECE)& II Semester (EEE,CS	SE&F	T)		
Course Objecti	ves:				
To expose to the fundamental kno	Γο expose to the field of electrical engineering, laws and principles of electrical engineering and to acquire Fundamental knowledge in the relevant field.				

Course Outcomes (CO): Student will be able to **CO1:** Remember the fundamental laws, operating principles of motors, generators, MC and MI instruments (L1). **CO2:** Understand the problem solving concepts associated to AC and DC circuits, construction and operation of AC and DC machines, measuring instruments; different power generation mechanisms, Electricity billing concept and important safety measures related to electrical operations (L2). **CO3:** Apply mathematical tools and fundamental concepts to derive various equations related to machines, circuits and measuring instruments; electricity bill calculations and layout representation of electrical power systems (L3). **CO4:**Analyze different electrical circuits, performance of machines and measuring instruments (L4). **CO5:** Evaluate different circuit configurations, Machine performance and Power systems operation (L5). Unit - I **DC & AC CIRCUITS** DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple Numerical problems. **AC Circuits:** A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Analysis of R-L, R-C, R-L-C Series circuits, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems). Unit - II MACHINES AND MEASURING INSTRUMENTS Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, (iv) Three Phase Induction Motor and (v) Alternator, Applications of electrical machines. Measuring Instruments: Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone bridge. **ENERGY RESOURCES, ELECTRICITY BILL & SAFETY MEASURES** Unit - III **Energy Resources:** Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation. **Electricity Bill:** Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers. Equipment Safety Measures: Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock. **Learning Resources: Textbooks:** 1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition 2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013 3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition **Reference Books:** 1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020 3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017 4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition. Web Resources:

1. https://nptel.ac.in/courses/108105053

2. https://nptel.ac.in/courses/108108076



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B.TECH -FOOD TECHNOLOGY (I B. Tech II Semester )

<b>Course Code</b>	ENGINEERING GRAPHICS			<b>D</b>	
22AME01	23AME01 (Common to All Branches of Engineering)		I	P	C
ZJAMEUI	(Common to An Branches of Engineering)	1	0	4	3
Somester	I B. Tech I Semester (Common to CE, ME & ECE)				
Semester	I B. Tech II Semester (Common to EEE, CSE & FT)				
Course Objecti	ves:				
<ul> <li>To enab</li> </ul>	le the students with various concepts like dimensioning, conventions and stan	dards	relate	d to	
Enginee	ring Drawing				
<ul> <li>To impa</li> </ul>	rt knowledge on the projection of points, lines and plane surfaces				
<ul> <li>To impr</li> </ul>	• To improve the visualization skills for better understanding of projection of solids				
<ul> <li>To deve</li> </ul>	• To develop the imaginative skills of the students required to understand Section of solids and				
Develop	ments of surfaces.				
To make	• To make the students understand the viewing perception of a solid object in Isometric and Derspective				

• To make the students understand the viewing perception of a solid object in Isometric and Perspective projections.

	· · · · · · · · · · · · · · · · · · ·
Course Outcom	nes (CO):
Students will be CO1: Understan isometric project CO2: Draw and CO3: Understan	able to d the principles of engineering drawing, including engineering curves, scales, orthographic and tions. interpret orthographic projections of points, lines, planes and solids in front, top and side views. d and draw projection of solids in various positions in first quadrant.
CO4: Explain pr	rinciples behind development of surfaces.
<b>CO5:</b> Prepare is	ometric and perspective sections of simple solids.
Unit - I	Introduction, Curves & Scales
Introduction: L by general metho Curves: constru- tangent to Curve Scales: Plain sca	ines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons ods. ction of ellipse, parabola and hyperbola by general method, Cycloids, Involutes, Normal and s. iles, diagonal scales and Vernier scales.
Unit - II	Orthographic Projections, Projections of Straight Lines and Planes
Orthographic P situated in any o Projections of S reference plane reference plane. Projections of P inclined to the other	<b>Projections</b> : Reference plane, importance of reference lines or Plane, Projections of a point ne of the four quadrants. <b>Straight Lines</b> : Projections of straight lines parallel to both reference planes, perpendicular to one and parallel to other reference plane, inclined to one reference plane and parallel to the other Projections of Straight Line Inclined to both the reference planes <b>Planes</b> : regular planes Perpendicular to both reference planes, parallel to one reference plane and ther reference plane inclined to both the reference planes.
Unit - III	Projections of Solids
Projections of	<b>Solids:</b> Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple
positions: Axis r	perpendicular to horizontal plane. Axis perpendicular to vertical plane and Axis parallel to both the
reference planes	Projection of Solids with axis inclined to one reference plane and parallel to another plane.
Unit - IV	Sections of Solids & Development of Surfaces
Sections of Solid of solids in simp <b>Development o</b> Development of	<b>ds:</b> Perpendicular and inclined section planes, Sectional views and True shape of section, Sections le position only. <b>f Surfaces:</b> Methods of Development: Parallel line development and radial line development. a cube, prism, cylinder, pyramid and cone.
Unit - V	Conversion of Views&Computer graphics
Conversion of V isometric views. Computer grap (Not for end example)	<b>/iews</b> : Conversion of isometric views to orthographic views; Conversion of orthographic views to <b>hics</b> : Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD <i>mination</i> ).
Learning Resou	Irces:
Textbooks: 1. N. D. Bhatt, E 2. Engineering D 3. Engineering D 4. Engineering D Reference Book	Engineering Drawing, Charotar Publishing House, 2016. Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013. Drawing, by P.S. Gill, S.K. Kataria and Sons publishers. Drawing + Auto CAD by K. Venugopal, V. Prabhu Raja., New Age Internationa; Publishers.
1. Engineering I	Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc,2009.

2. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA. B.TECH.- COMPUTER SCIENCE & ENGINEERING

IT WORKSHOP	L	
23ACS03(Common to all branches of Engineering)002	1	
Semester I Year B. Lech. – I Semester & II Semester		
<b>Course Objectives:</b> The main objective of the course is to		
• To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables		
• To demonstrate configuring the system as Dual boot both Windows and other Operating Systems	/iz.	
Linux, BOSS		
To teach basic command line interface commands on Linux.		
To teach the usage of Internet for productivity and self-paced life-long learning		
To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word process	ors,	
Spread sheets and Presentation tools.		
<b>Course Outcomes:</b> After completion of the course, students will be able to		
CO1: Perform Hardware troubleshooting.		
CO2: Understand Hardware components and inter dependencies.		

CO3: Safeguard computer systems from viruses/worms. CO4: Document/ Presentation preparation. CO5: Perform calculations using spreadsheets.

## PC Hardware & Software Installation

**Task 1:** Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

**Task 2:** Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

**Task 3**: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Task 4:** Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot (VMWare) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

**Task 5:** Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify the installation and follow it up with a Viva

## Internet & World Wide Web

**Task1:** Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Task 2:** Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Task 3**: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

**Task 4:** Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

# LaTeX and WORD

**Task 1** – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La TeXand word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using La TeX and Word to create a project certificate. Features to be covered:-

Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

**Task 3:** Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

**Task 4:** Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

# EXCEL

**Excel Orientation:** The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

**Task 1:** Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

**Task 2:** Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

## LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

## **POWER POINT**

**Task 1:** Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

**Task 2:** Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

**Task 3:** Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

## AI TOOLS – ChatGPT

**Task 1:** Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

• Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

**Task 2:** Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

• Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this new reality."

**Task 3:** Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the

translations are.

• Ex:Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

### **Reference Books:**

- 1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
- 2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition
- 3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012, 2<sup>nd</sup> edition
- 4. PC Hardware A Handbook, Kate J. Chase, PHI (Microsoft)
- 5. LaTeX Companion, Leslie Lamport, PHI/Pearson.
- 6. IT Essentials PC Hardware and Software Companion Guide, David Anfins on and Ken Quamme. CISCO Press, Pearson Education, 3<sup>rd</sup> edition

7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3<sup>rd</sup> edition



### JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt.), A.P., INDIA. B.TECH.-FOOD TECHNOLOGY (I B. Tech II Semester )

# **Fundamentals of Food & Nutrition**

LTPC

3 0 0 3

## **Course objectives:**

- To provide the basic knowledge about food technology and importance.
- To Study about the various nutrients and their role in foods.
- To learn about growth of Indian Food processing industry, recent technologies of food processing and their principles and applications.
- To get educate about various organization governing the food processing sector.

## **Course Outcomes:**

By the end of the course, the students will be able to

- Know about food technology and importance.
- Study about various nutrients and their role in foods, growth of Indian Food processing industry and recent technologies
- Learn about various government organizations and their role in food processing sector.

## Fundamentals of Food & Nutrition

### UNIT-I

Introduction - Food Science and Technology. Definition - Food science, Food technology and their sub discipline, difference between Food Science and Technology 3. Status of food processing industry in India and abroad. Potential and prospects of Indian food Industry. Ministry of Food Processing - Objectives and its function to develop the food processing industry. APEDA, MPEDA, FSSAI roles & functions.

### UNIT-II

Methods of cooking. Nutrition – Relation to good health. Characteristics of well and malnourished, urban malnutrition population. Energy Definition, determination of energy requirements. Determination of food energy and total energy needs of the body.

### UNIT-III

Carbohydrates – Classification, properties, functions, sources and requirements. Carbohydrates –Digestion, absorption and utilization. Proteins –classification, properties, functions, sources, requirements, essential and non-essential amino acids, Proteins – digestion and absorption, Quality of proteins –PER, NPR, NPU, supplementary value of proteins and deficiency diseases

#### UNIT-IV

Lipids –classification, properties, functions, sources, requirements. saturated and unsaturated fatty acids. Lipids – Digestion, absorption and utilization and deficiency diseases. Vitamins: Water soluble vitamins – functions, sources, requirements and deficiency diseases. Fat soluble vitamins – functions, sources, requirements and deficiency diseases. Minerals – Classification, functions, sources, requirements and deficiency diseases.

#### UNIT-V

New food product development - Strategies for new product development - Recent trends for processing of food, its principle and application, new techniques for new food product development - Genetically modified foods - Advantages and disadvantages. Functional foods - formulated foods - Special foods - Imitation meat food / meat imitation - meat food - definitions - Advantages and disadvantages. Programmes for food production - food security - factors affecting on food security - Green revolution - White revolution. World Food Day - Importance for theme - Agricultural growth and plan for elimination of Hunger. National and International trends in food handling, processing and marketing.

#### References

- 1. Srilakshmi, B., 2003, FOOD SCIENCE, 3rd Edition, New Age International Publishers, New Delhi.
- 2. Benion, M., 1990 Introductory Foods, 8th Edn., The MacMillan Co. London.
- 3. Meyer, L.H. 1991, Food Chemistry, Affiliated East-West Press Pvt.Ltd., New Delhi.
- 4. Swaminathan, M. 1995, Food Science and Experimental Foods, Ganesh and Co., Madras.
- 5. Potter, N. 1987. Food Science, CBS Publishers and Distributors, Delhi.
- 6. Desai B.M., Gupta N.V. and Namboodri. Food Processing Industries. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

7. Graft and Saguy. Food Product Development (From concept to market place). CBS Publishers, New Delhi.



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR COLLEGE OF ENGINEERING (AUTONOUMS) KALIKIRI-517234, ANNAMAYYA (Dt.), A.P., INDIA. B.TECH.-FOOD TECHNOLOGY (I B. Tech II Semester)

Course Code					
	ENGINEERING PHYSICS LAB	L	Т	P	С
23ABS01P	(Common to all Branches Of Engineering)	•	•	2	1
		0	0	2	1
Semester	I B. Tech I Sem (CE, ME & ECE) I B. Tech II Semester (EEE, CSE	& F1	[)		
Course Object	ives:				
To study the co	oncepts of optical phenomenon like interference, diffraction etc., recog	nize tl	he im	portai	nce of
energy gap in	the study of conductivity and Hall effect in semiconductors and stud	ly the	e para	meter	rs and
applications of	dielectric and magnetic materials by conducting experiments.				
Course Outcon	nes (CO): Student will be able to				
CO1: Operate of	optical instruments like travelling microscope and spectrometer. (L5)				
CO2: Estimate	the wavelengths of different colours using diffraction grating. (L5)				
CO3: Estimate	e hall coefficient of a given semiconductor. (L5)				
CO4:Evaluate	dielectric constant for dielectric and plot B H curve of ferro magnetic mat	erial r	espec	tively	.(L5)
CO5: Calculate	e the band gap of a given semiconductor. (L5)		-	-	
List of Experi	nents:				
1. Determ	ination of radius of curvature of a given Plano-convex lens by Newton's	rings.			
2. Determ	ination of wavelengths of different spectral lines in mercury spectrum us	sing d	iffrac	tion g	rating
in norm	al incidence configuration.				

3. Verification of Brewster's law

- 4. Determination of dielectric constant using charging and discharging method.
- 5. Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
- 6. Determination of wavelength of Laser light using diffraction grating.
- 7. Estimation of Planck's constant using photoelectric effect.
- 8. Determination of the resistivity of semiconductors by four probe methods.
- 9. Determination of energy gap of a semiconductor using p-n junction diode.
- 10. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
- 11. Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall effect.
- 12. Determination of temperature coefficients of a thermistor.
- 13. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
- 14. Determination of magnetic susceptibility by Kundt's tube method.
- 15. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
- 16. Sonometer: Verification of laws of stretched string.
- 17. Determination of young's modulus for the given material of wooden scale by non-uniform bending (or double cantilever) method.
- 18. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.

**Note:** Any TEN of the listed experiments are to be conducted. Out of which any TWO experiments may be conducted in virtual mode.

### **Learning Resources:**

### **References Books:**

• A Textbook of Practical Physics - S. Balasubramanian, M.N. Srinivasan, S. Chand Publishers, 2017.

### Web Resources:

- <u>www.vlab.co.in</u>
- <u>https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype</u>



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Course Code	Electrical & Electronics Engineering Workshop	т	т	D	C
224 BEE02	Part A: Basic Electrical Engineering	<b>L</b>	<b>1</b>	Г —	C
23ADEEU2	(Common to All Branches)	0	0	3	1.5
Semester	I B. Tech I Semester (CE,ME& ECE)& II Semester (EEE,C	SE&F	T)		
Course Objecti	ves:				
To impart know	ledge on the fundamental laws & theorems of electrical circuits, functions of	of elec	trical	mach	ines
and energy calcu	llations.				
<b>Course Outcom</b>	<b>tes (CO):</b> By the end of the course, the student will be able to:				
CO1: Understar	d the Electrical circuit design concept; measurement of resistance, power, p	ower	facto	r; con	cept
of wiring	g and operation of Electrical Machines and Transformer (L2)				
CO2: Apply th	e theoretical concepts and operating principles to derive mathematical	mode	els foi	r circ	uits,
Electrical	machines and measuring instruments; calculations for the measurement of a	resista	nce, p	ower	and
power fac	tor (L3)				
CO3: Apply the	theoretical concepts to obtain calculations for the measurement of resistan	ce, po	wer a	ind po	wer
factor (L3					
CO4: Analyze v	arious characteristics of electrical circuits, electrical machines and measuring	; instri	ument	s (L4	)
CO5: Design su	itable circuits and methodologies for the measurement of various electrical pa	arame	ters; F	House	hold
and comm	nercial wiring (L5)				
List of Experim	ents:				
All the followin	g ten experiments are required to be conducted				
1. Verification o	f KCL and KVL				
2. Verification of Superposition theorem					
3. Measurement	of Resistance using Wheat stone bridge				
4. Magnetization	Characteristics of DC shunt Generator				

- 5. Measurement of Power and Power factor using Single-phase wattmeter
- 6. Measurement of Earth Resistance using Megger
- 7. Calculation of Electrical Energy for Domestic Premises

## **Learning Resources:**

### **Reference Books:**

- 1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
- 2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

### Web Resources:

http://vlabs.iitkgp.ernet.in/asnm/index.html https://vlab.amrita.edu/?sub=1&brch=75



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### Fundamentals of Food & Nutrition Lab

### **Course Objectives:**

- To impart knowledge on basics of food technology
- To explore the various qualitative and quantitative analysis methods

### **Course Outcomes (CO):**

- Students will able to learn the measuring & identify the different food ingredients
- Learn about the qualitative and quantitative analysis of different nutrients.
- Learn about basics of cooking properties.

### **Practicals:**

- 1. Methods of measuring food ingredients introducing weighing scale, weighing cups and spoons
- 2. Identification of the different food grains.Cereals, Legumes, nuts and oils seeds.
- 3. Demonstration of different cooking methods Boiling, deep frying, shallow frying, steaming, stewing, fraising, baking
- 4. Effect of cooking on volume and weight
- 5. Demonstration of various perishable food items and degree of spoilage
- 6. Blanching of food items i.e. leafy vegetables, fruits, vegetables etc.
- 7. Qualitative tests for the identification of Carbohydrates (Molisch test, Benedict's test, Iodine test etc.)
- 8. Quantitative tests for the identification of Carbohydrates (Anthrone test, Phenol sulphuric acid method, Nelson Somogyi's method etc.)
- 9. Qualitative tests for the identification of Lipids
- 10. Quantitative tests for the identification of Lipids

- 11. Qualitative tests for the identification of Protein (Paper Chromatography of Amino Acids, Xanthoproteic test, Millon test etc.)
- 12. Quantitative tests for the identification of Protein (Folin-lowry's method, Braford protein assay, Ninhydrin test etc.)



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(I B. Tech II Semester)

<b>Course Code</b>		T	т	D		
234 HSS2	NSS/NCC/SCOUTS&GUIDES/COMMUNITYSERVICE		Т	Р		
25/11332	(Common to all Branches)	0	0	1	0.5	
Semester	I B. Tech I Sem (CE, ME & ECE) I B. Tech II Sem (EEE, CSE & FT)					
Course Objecti	ves:					
The objective consciousness a	of introducing this course is to impart discipline, character, fraternit nong the students and engaging them in selfless service.	y, tea	amwo	rk, so	ocial	
<b>Course Outcom</b>	es (CO): Student will be able to					
<ul> <li>CO1: Understandtheimportanceofdiscipline, characterandservicemotto.</li> <li>CO2: Solvesomesocietalissues byapplyingacquiredknowledge,facts,andtechniques</li> <li>CO3: Explorehumanrelationships byanalyzingsocialproblems</li> <li>CO4: Determineto extendtheirhelpforthefellowbeings anddowntroddenpeople</li> <li>CO5: Developleaderchipskillsandsivis responsibilities</li> </ul>						
UNIT I	Orientation					
GeneralOrienta	ationonNSS/NCC/Scouts&Guides/CommunityServiceactivities, Career guida	ince.				
Activities:						
i) Condu andski	cting –ice breaking sessions-expectations from the course-knowing personal lls	talent	S			
ii) Condu	cting orientation programs for the students-future plans-activities-releasing roading the standard strength standard strength s	napeto	2.			
iii) Displa	yingsuccessstories-motivationalbiopics-awardwinningmoviesonsocietalissue	setc.				
iv) Condu	ctingtalent showinsingingpatrioticsongs-paintings-anyothercontribution.					
UNIT II	UNIT II Nature & Care					

### Activities:

- i) Bestoutofwastecompetition.
- ii) Posterandsignsmakingcompetitiontospreadenvironmentalawareness.
- iii) Recyclingandenvironmentalpollutionarticlewritingcompetition.
- iv) OrganisingZero-wasteday.
- v) DigitalEnvironmentalawarenessactivityviavarioussocialmediaplatforms.
- vi) Virtualdemonstrationofdifferenteco-friendlyapproaches forsustainableliving.
- vii) Writeasummaryonanybookrelatedto environmentalissues.

UNIT	UNIT III		CommunityService								
A											
Activiti	es:										
i)	Condu identif	ConductingOneDaySpecialCampinavillagecontactingvillage-arealeaders-Surveyin the village, identification of problems- helping them to solve via media- authorities-experts-etc.									
ii)	Condu Health	cting ,Menta	awareness lhealth,Spirit	programs ualHealth,Hi	on V/AI	Health-related DS,	issues	such	as	General	
iii	iii) ConductingconsumerAwareness-Explaining variouslegalprovisionsetc.										
iv	iv) WomenEmpowermentProgrammes-SexualAbuse.AdolescentHealthandPopulationEducation.										

v) Anyotherprogrammesincollaborationwith localcharities,NGOsetc.

### **Reference Books:**

- 1. Nirmalya Kumar Sinha & Surajit Majumder, A Text Book of National Service Scheme Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81-952368-8-6)
- 2. Red Book National Cadet Corps Standing Instructions Vol I & II, Directorate General of NCC, Ministry of Defence, New Delhi
- 3. Davis M. L. and Cornwell D. A., Introduction to Environmental Engineering, McGraw Hill, New York 4/e 2008
- 4. Masters G. M., Joseph K. and Nagendran R. Introduction to Environmental Engineering and Science, Pearson Education, New Delhi. 2/e 2007
- 5. Ram Ahuja. Social Problems in India, Rawat Publications, New Delhi.

#### **General Guidelines:**

Institutes must assign slots in the Timetable for the activities.

Institutes are required to provide instructor to mentor the students.

### **Evaluation Guidelines:**

Evaluated for a total of 100 marks.

A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totaling to 90 marks.

A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject