KAKATIYA UNIVERSITY, WARANGAL - 506 009
B.Sc. PROGRAMME
Under CBCS System
Scheme wef A.Y: 2019-20

FIRST YEAR

SEMESTER - I

Code	Course category	Title of the Paper	No. of Credits	Hrs PW	Internal Exam	End Exam	Lab	Total Marks
BS101	AECC-1	Environmental Science	2	2	10	40	-	50
BS102	FL-1A	English	4	4	20	80	-	100
BS103	SL-1A	Second Language	4	4	20	80	-	100
BS104	DSC-1A	Optional - I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS105	DSC-2A	Optional– II	4	4	20	80	25	125
		Optional – II LAB	1	3				
BS106	DSC-3A	Optional – III	4	4	20	80	25	125
		Optional – III LAB	1	3				
		TOTAL:	25	-	110	440	75	625

SEMESTER – II

Code	Course category	Title of the Paper	No. of Credits	Hrs PW	Internal Exam	End Exam	Lab	Total Marks
BS201	AECC-2	Basic Computer Skills (Taught by: Computer Science)	2	2	10	40	-	50
BS202	FL-2B	English	4	4	20	80	-	100
BS203	SL-2B	Second Language	4	4	20	80	-	100
BS204	DSC-1B	Optional - I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS205	DSC-2B	Optional – II	4	4	20	80	25	125
		Optional – II Lab	1	3				
BS206	DSC-3B	Optional – III	4	4	20	80	25	125
		Optional – III LAB	1	3				
		TOTAL :	25	-	110	440	75	625

KAKATIYA UNIVERSITY, WARANGAL - 506 009
B.Sc. PROGRAMME
Under CBCS System
Scheme wef A.Y: 2020-21

SECOND YEAR

SEMESTER - III

Code	Course category	Title of the Paper	No. of Credits	Hrs PW	Internal Exam	End Exam	Lab	Total Marks
BS 301	SEC-1	Fundamentals of Nano Technology (Taught by : Physics)	2	2	10	40	-	50
BS 302	SEC-2	Bio Statistics (Taught by : Statistics)	2	2	10	40	-	50
BS 303	FL-3 A	English	3	3	15	60	-	75
BS 304	SL-3 B	Second Language	3	3	15	60	-	75
BS 305	DSC-1C	Optional - I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS 306	DSC-2C	Optional – II	4	4	20	80	25	125
		Optional– II Lab	1	3				
BS 307	DSC-3C	Optional – III	4	4	20	80	25	125
		Optional – III Lab	1	3				
		TOTAL:	25	-	110	440	75	625

SEMESTER - IV

Code	Course category	Title of the Paper	No. of Credits	Hrs PW	Internal Exam	End Exam	Lab	Total Marks
BS401	SEC-3	Fundamentals of Python (Taught by: Computer Science)	2	2	10	40	-	50
BS402	SEC-4	Remedial Methods of Pollution – Drinking Water & Soil Fertility (Taught by: Chemistry)	2	2	10	40	-	50
BS403	FL-4 A	English	3	3	15	60	-	75
BS404	SL-4 B	Second Language	3	3	15	60	-	75
BS405	DSC-1D	Optional - I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS406	DSC-2D	Optional – II	4	4	20	80	25	125
		Optional – II Lab	1	3				
BS407	DSC-3D	Optional – III	4	4	20	80	25	125
		Optional– III Lab	1	3				
		TOTAL :	25	-	110	440	75	625

KAKATIYA UNIVERSITY, WARANGAL - 506 009
B.Sc. PROGRAMME
Under CBCS System
Scheme wef A.Y: 2021-2022

THIRD YEAR

SEMESTER - V

Code	Course Type	Title of the Paper	No. of Credits	Hrs PW	Max. Marks Internal Exam	Max. Marks End Exam	Max. Marks Lab	Total Marks
BS 501	FL-5 A	English	3	3	15	60	-	75
BS 502	SL-5 B	Second Language	3	3	15	60	-	75
BS 503	G.E.	Water Resources Management (Taught by: Any Science Dept.)	4	4	20	80	-	100
BS 504	DSE-1E	Optional – I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS 505	DSE-2E	Optional – II	4	4	20	80	25	125
		Optional – II Lab	1	3				
BS506	DSE-3E	Optional – III	4	4	20	80	25	125
		Optional – III Lab	1	3				
		TOTAL:	**25**	**-**	**110**	**440**	**75**	**625**

SEMESTER - VI

Code	Course Type	Title of the Paper	No. of Credits	Hrs PW	Max. Marks Internal Exam	Max. Marks End Exam	Max. Marks Lab	Total Marks
BS 601	FL-6A	English	3	3	15	60	-	75
BS 602	SL-6 B	Second Language	3	3	15	60	-	75
BS 603	P.W / Optional	Optional: Public Health & Hygiene (Taught by: Zoology / Botany / Biotechnology / Micro Biology)	4	4	20	80	-	100
BS 604	DSE-1F	Optional - I	4	4	20	80	25	125
		Optional – I Lab	1	3				
BS 605	DSE-2F	Optional – II	4	4	20	80	25	125
		Optional – II Lab	1	3				
BS 606	DSE-3F	Optional – III	4	4	20	80	25	125
		Optional – III Lab	1	3				
		TOTAL:	**25**	**-**	**110**	**440**	**75**	**625**

KAKATIYA UNIVERSITY

B.SC I YEAR SEMESTER-I - CBCS

Ability Enhancement Compulsory Course (AECC)

ENVIRONMENTAL STUDIES

(2 hrs./week)   Credits – 2

UNIT - I : Ecosystem, Biodiversity & Natural Resources   (15 hrs.)

1. Definition, Scope & Importance of Environmental Studies.
2. Structure of Ecosystem – Abiotic & Biotic components Producers, Consumers, Decomposers, Food chains, Food webs, Ecological pyramids)
3. Function of an Ecosystem :Energy flow in the Ecosystem (Single channel energy flow model)
4. Definition of Biodiversity , Genetic,Species & Ecosystem diversity , Hot-spots of Biodiversity, Threats to Biodiversity , Conservation of Biodiversity (Insitu & Exsitu)
5. Renewable & Non – renewable resources, Brief account of Forest , Mineral & Energy (Solar Energy & Geothermal Energy) resources
6. Water Conservation , Rain water harvesting & Watershed management.

UNIT – II: Environmental Pollution , Global Issues & Legislation   (15 hrs.)

1. Causes, Effects & Control measures of Air Pollution, Water Pollution
2. Solid Waste Management
3. Global Warming & Ozone layer depletion.
4. Ill – effects of Fire- works
5. Disaster management – floods, earthquakes & cyclones
6. Environmental legislation :-
(a) Wild life Protection Act (b) Forest Act (c) Water Act (d) Air Act
7. Human Rights
8. Women and Child welfare
9. Role of Information technology in environment and human health

❖ **Field Study:**   (5 hours)
- Pond Ecosystem
- Forest Ecosystem

REFERENCES:

- Environmental Studies - from crisis to cure – by R. Rajagopalan (Third edition) Oxford University Press.
- Text book of Environmental Studies for undergraduate courses (second edition) by Erach Bharucha
- A text book of Environmental Studies by Dr.D.K.Asthana and Dr. Meera Asthana

Dr. G. SHAMITHA
Chairperson
Board of Studies
Department of Zoology & Sericulture Unit
KAKATIYA UNIVERSITY - WGL-506009 (T.S)

KAKATIYA UNIVERSITY
B.Sc. I YEAR SEMESTER-II
Ability Enhancement Compulsory Course (AECC)
Basic Computer Skills

FUNDAMENTALS OF COMPUTERS

Unit-I:

Introduction to Computers: what is a computer, characteristics of Computers, Generations of Computers, Classifications of Computers, Basic Computer organization, Applications of Computers. Input and Output Devices: Input devices, Output devices, Softcopy devices, Hard copy devices. Computer Memory and Processors: Introduction, Memory Hierarchy, Processor, Registers, Cache memory, primary memory, secondary storage devices, magnetic tapes, floppy disks, hard disks, optical drives, USB flash drivers, Memory cards, Mass storage devices, Basic processors architecture.

Unit-II:

Number System and Computer Codes: Binary number system, working with binary numbers, octal number system, hexadecimal number system, working with fractions, signed number representation in binary form, BCD code, and other codes. Boolean algebra and logic gates: Boolean algebra, Venn diagrams, representation of Boolean functions, logic gates, logic diagrams and Boolean expressions using karnaugh map. Computer Software: Introduction to computer software, classification of computer software, system software, application software, firmware, middleware, acquiring computer software, design and implementation of correct, efficient and maintainable programs.

Text: ReemaThareja, Fundamentals of Computers.

References

1. V.Rajaraman, 6th Edition Fundamentals of Computers, NeeharikaAdabala.
2. Anita Goel, Computer Fundamentals.

Department of Computer Science, KU   With Effect from the Academic Year 2019-2020

KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
B.Sc. Programme under CBCS
With effect from the A.Y: 2019
Skill Enhancement Course- I
II Year
(Common to all Science Courses)
SEMESTER – III

FUNDAMENTALS OF NANO TECHNOLOGY

Theory: 2 Hours/Week;   Credits: 2   Marks: 50 (Internal: 10; External: 40)

UNIT I:
Background to Nanotechnology:
Scientific revolution, molecular and atomic size, emergence of Nanotechnology,
Challenges in Nanotechnology, Carbon age :(new forms of carbon graphene sheet to CNT)

Nucleation:
Macroscopic to microscopic crystals and nanocrystals, large surface to volume ratio, top-down and bottom-up approaches, self-assembly process, grain bounda volume in nanocrystals, defects in nanocrystals, surface effects on the properties.

UNIT- II:
Nano materials and properties:
Types of Nanostructure: one dimensional (ID), two dimensional (2D), three dimensional (3D) Nanostructured materials, Quantum dots, Quantum wire, Quantum sheet structures.

Carbon nanotubes (CNT), Metals (Au, Ag), Metal oxides(TiO_2,Zno), semiconductors (Si, Ge, CdS, ZnSe), Ceramics and composites, Biological system, DNA, RNA, Lipids, Size dependent properties, mechanical, physical and chemical properties.

Applications of Nanomaterials:
Molecular electronics and nano electronics, Quantum electronic devices, CNT based transistor and Field emission Display, biological applications, Biochemical sensor, Membrane based water purification.

Reference books:
1. Nanotechnology: Basic science and emerging technologies, M.Wilson, K.Kannangara, G. Smith, Overseas Press India PVT.LTD,NEW DELHI:
2. The chemistry of Nanomaterials: Synthesis, properties & applications. C.N.R.Rao, A.Muller, Wiley
3. Nano structures and Nano materials: Synthesis, properties and applications by Guozhong Cao, Imperial College press.
4. Hari Singh Nalwa, Handbook of nanostructured materials &nanotechnology optical properties.
5. Nano fabrication towards biomedical applications, C.S.S.R.Kumar, Wiley-VCH Verlag GmbH & Co, Weinheim.

Mrs. G. Manjula, Chairperson, BoS   Prof. B. Venkatram Reddy, HoD

KAKATIYA UNIVERSITY
B.Sc. PROGRAMME
Under CBCS System wef A.Y: 2020-21
Second Year : : Semester- III

BS-302 / SEC-2: BIO STATISTICS
[2 HPW, #Credits: 2, Marks: 50 (Internal:10, External:40)]

Unit-I

Descriptive and Relational Statistics: Data collection and tabulation, Graphical representation of data, Measures of central tendency (Mean, Median and Mode) with simple applications, Measures of dispersion (Range, Quartile Deviation, Mean Deviation, Standard Deviation, Standard error and Coefficient of variation) with simple applications, Concept of Skewness and Kurtosis.

Concept of correlation, computation of Karl-Pearson correlation coefficient, Spearman' s rank correlation coefficient and Simple linear regression with simple applications,

Unit-II

Probability and Inferential Statistics: Basic concepts and Basic terms of probability, Mathematical, Statistical and Axiomatic definitions of probability Conditional probability and independence of events, Addition and multiplication theorems (Statements only) with simple applications. Statements and applications of Binomial, Poisson and Normal distributions.

Concepts of Population, Sample, Parameter, Statistic, Null and Alternative hypotheses, Critical region, two types of errors, Level of significance. Tests of significance based on goodness of fit, means, variances using χ^2 test, t-test, F-test and analysis of variance (ANOVA).

References:

1. Irfan Ali Khan and Atiya Khanum: Fundamentals of Bio Statistics, Ukaaz Publications, HYD.

2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.

3. V. K. Kapoor and S. C. Gupta: Statistical Methods, Sultan Chand & Sons, New Delhi.

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KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
B.Sc. Programme under CBCS
With effect from the A.Y: 2019
Skill Enhancement Course- III
II Year
(Common to all Science Courses)
SEMESTER – IV

Fundamentals of Python

Theory:　　　2 Hours/Week;　　　Credits: 2　　　Marks: 50 (Internal: 10; External: 40)

Unit – I
Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle, Input, Processing, and Output, Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations (Operators. Type conversions, Expressions), More about Data Output. Decision Structures and Boolean Logic: if, if-else, if-elif-else Statements, Nested Decision Structures, Comparing Strings, Logical Operators, Boolean Variables. Repetition Structures: Introduction, while loop, for loop, Calculating a Running Total, Input Validation Loops, Nested Loops.Lists and Tuples: Sequences, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Processing Lists,

Unit – II
Tuples- operations on tuples, Strings: Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings. Dictionaries and Sets: Dictionaries, Sets- operations on sets and Dictionaries. Functions: Introduction, Defining and Calling a Void Function, Designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions- Generating Random Numbers, Writing Our Own Value-Returning Functions, The math Module, Storing Functions in Modules. File and Exceptions: Introduction to File Input and Output, Using Loops to Process Files, Processing Records, Exceptions.

Text Book:
Tony Gaddis, Starting Out With Python (3e)

References:
1. Kenneth A. Lambert, Fundamentals of Python
2. Clinton W. Brownley, Foundations for Analytics with Python
3. James Payne, Beginning Python using Python 2.6 and Python 3
4. Charles Dierach, Introduction to Computer Science using Python
5. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3

Remedial Methods of Pollution - Drinking Water & Soil Fertility
[2HPW, #Credits: 2, Marks:50 (Internal:10, External:40)]
(Taught by: Chemistry Department)

UNIT I: Remedial Methods for Pollution:

Prevention and control of air pollution: Ozone hole - Causes and harm due to ozone depletion, Effect of CFC's in Ozone depletion and their replacements, Global Warming and Green-house effect, Precaution measures to control global warming, Deleterious effect of pollutants, Endangered monuments, Acid rain, Precautions to protect monuments, Sources of Radiation pollution, Chernobyl accident and its consequences. Radiation effect by usage of cell phones and protection tips, Deleterious effects of cell phone towers and health hazards.

Sources of water pollution: (i) Pollution due to pesticides and inorganic chemicals, (ii) Thermal pollution (iii) Ground water pollution (iv) Eutrophication.
Methods for control of water pollution and water recycling: Dumping of plastics in rivers and oceans and their effect on aquatic life, Determination of (i) Dissolved oxygen and (ii) Chemical Oxygen demand in polluted water, Illustration through charts (or) demonstration of experiments,

Sources of soil pollution: (i) Plastic bags (ii) Industrial and (iii) Agricultural sources, Control of soil pollution, Environmental laws in India, Environmental benefits of planting trees.

UNIT II: Drinking Water and Soil Fertility Standards and Analysis:

Water quality and common treatments for private drinking water systems, Drinking Water Standards: 1. Primary drinking water standards: Inorganics, Organics and Volatile Organic Chemicals, 2. Secondary drinking water standards: Inorganics and Physical Problems, Water testing, Mineral analysis, Microbiological tests, Pesticide and Other Organic Chemical Tests, Principle involved in Water Treatment Techniques: (i) Reverse Osmosis (ii) Disinfection methods such as Chlorination, Ultraviolet light, ozonation etc… (iii) Chemical oxidation and iv) Ion exchange (water softeners). Visit to nearby drinking water plants and interaction at sites.

Introduction to Soil Chemistry: Basic Concepts. Effect of P^H on nutrient availability, Macronutrients and their effect on plants, Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus, other macronutrients, Calcium, Magnesium and Sulfur, Micronutrients and their effect on plants, Boron ($B_4O_7{}^{2-}$), Copper (Cu^{2+}), Iron (Fe^{2+}, Fe^{3+}), Manganese (Mn^{2+}), Molybdenum ($MoO_4{}^{2-}$), Zinc (Zn^{2+}), Cobalt (Co^{2+}), Chlorine (Cl^-) and others. Determination of soil nitrogen by Kjeldahl method, Illustration through charts and demonstration of experiment, Visit to nearby agricultural forms and interaction with farmers, Discussion with farmers on the use of 'Soil Analysis Kits'.

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KAKATIYA UNIVERSITY, WARANGAL-506 009
B.Sc. Under CBCS System wef A.Y: 2021-22
Third Year : : Semester - V
GENERIC ELECTIVE (Common to all students)

WATER RESOURCES MANAGEMENT

(4 hrs/week) (Taught by ant Science Dept)   (Credits:4)   (Marks:100)

UNIT-I:

Introduction to water resources management, different types of water resources, water resources and its importance, Global distribution of water. Hydrological cycle, Conservation of water, recycling of water.

Unit-II:

Rain water harvesting, methods of roof top rain water harvesting in urban setting: Direct method - Storing rain water in tanks for direct use; indirect methods - Recharge pits, bore wells/dug wells, Recharge trenches. Over use of surface and ground water and control measures.

UNIT-III:

Importance of water shed and water shed management, Rain water harvesting in rural setting: Check dams, percolation tanks, gabion structure, continuous contour trenches, staggered contour trenches, farm ponds. Surface water and ground water pollution, control measures.

UNIT-IV :

Mission Bhagiratha: Telangana government water grid project for drinking water supply - aims and objectives and method of implementation.Mission Kakatiya: Telangana government project for the restoration of minor irrigation tanks, aims and objectives and method of implementation.

Text books:

1) Water Resources, Conservation and Management by Chatterjee, S.N.
2) Groundwater hydrology by Todd
3) Watershed management by J.V.S.Murthy
4) Applied Hydrogeology by Fetter.

KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
B.Sc. Programme under CBCS
With effect from the A.Y: 2019
Optional Paper
(Common to all Science Courses)
III Year SEMESTER – VI

PUBLIC HEALTH AND HYGIENE

UNIT-I: Nutrition, Environment and Health

1.1 Classification of foods – Carbohydrates, Proteins, Lipids and Minerals.
1.2 Nutritional deficiencies and disorders of Carbohydrates, Proteins, Lipids and Minerals.
1.3 Concept, Steps and Applications of Environment and Health Impact Assessment.
1.4 Industrial, Agricultural and Urban Health. Environmental Pollution and Associated Health Hazards.

UNIT-II : Communicable and Non-Communicable Diseases

2.1 Causes, symptoms, diagnosis, treatment and prevention of Communicable Diseases (Malaria, Filaria, Tuberculosis and AIDS).
2.2 Causes, symptoms, diagnosis, treatment and prevention of Non-Communicable Diseases (Hypertension, Coronary Heart Diseases, Diabetes and Obesity).
2.3 Symptoms, treatment and prevention measures of Water Borne Diseases (Diarrhea, Typhoid, Hepatitis and Amebiasis).
2.4 Symptoms, treatment and prevention measures Air Borne Diseases (COVID-19, Influenza, Whooping couph and Chickenpox).

UNIT-III :Food and Diet Systems

3.1 Definition of Food, Types of foods (Texturized foods, Novel foods and Organic foods).
3.2 Food safety system and issues; Physical, chemical and microbiological contaminants; The significance of foodborne diseases.
3.3 Principles of diet in diseases, Classification of diets according to nutrients.
3.4 Etiology, Symptom and Dietary Management in Obesity, Underweight, Hypertension, Diabetes Mellitus, Atherosclerosis.

UNIT-IV : Personal Hygiene and Sanitation

4.1 Definition of Hygiene and Sanitation, Personal Hygiene of food handler, Techniques of Washing Hands, Pest control and Garbage Disposal.
4.2 Definition of Public Health, Hygiene, Social and Preventive Medicine, Basic aspects of Personal Hygiene and Disposal of Waste.
4.3 The Hygiene Practices of the different categories of family members (children, parents and aged members)
4.4 Definition of Sanitation, Environmental Sanitation, Sanitation of Food Serving Institution, The importance of proper sanitation practices.

Suggested Readings:

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DEPARTMENT OF ENGLISH
KAKATIYA UNIVERSITY
SYLLABUS FOR I YEAR (I SEMESTER) GENERAL ENGLISH
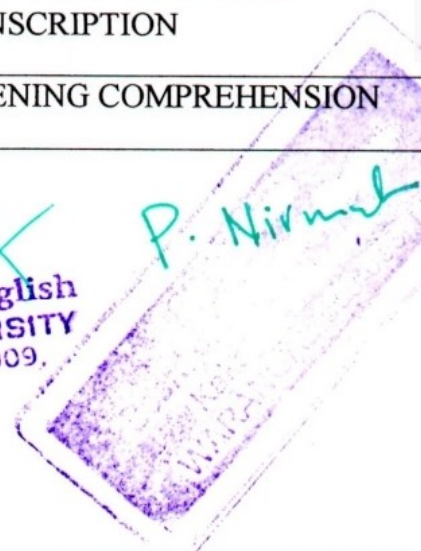### AT UNDERGRADUATE LEVEL
w.e.f (under CBCS from 2019-2020)

Text Book Entitled - *English for Advancement* for I Year, (Sem I & II) 4 Credits
Published by Orient BlackSwan

UNIT ONE (SHORT FICTION)	TEXT	AN ASTROLOGER'S DAY by R.K.NARAYAN
	GRAMMAR	NOUNS AND PRONOUNS
	VOCABULARY	WORD ROOTS
	READING COMPREHENSION	HAZARDS OF FOOD COLOURING
	PRONUNICATION	CONSONANTAL SOUNDS
	LANGUAGE SKILLS	TYPES OF LISTENING
	SOFT SKILLS	MOTIVATION AND GOAL-SETTING
UNIT TWO (PROSE)	TEXT	OF STUDIES by FRANCIS BACON
	GRAMMAR	ADJECTIVES
	VOCABULARY	FUNNY SIDE OF ENGLISH
	READING COMPREHENSION	PLEASURES OF IGNORANCE by ROBERT LYND
	PRONUNICATION	VOWEL SOUNDS
	LANGUAGE SKILLS	CONVERSATION SKILLS
	SOFT SKILLS	TIME MANAGEMENT
UNIT THREE (POETRY)	TEXT	A POISON TREE by WILLIAM BLAKE
	GRAMMAR	ADVERBS
	SPELLING	COMMONLY MISSPELT WORDS

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Department of English
KAKATIYA UNIVERSITY

P. Nirmal

	READING COMPREHENSION	VALUES IN LIFE by RUDYARD KIPLING
	PRONUNCIATION	PHONETIC TRANSCRIPTION
	SOFT SKILLS	EMOTIONAL INTELLIGENCE & SOCIAL CONSCIOUSNESS
UNIT FOUR (DRAMA)	**TEXT**	**THE RISING OF THE MOON by LADY GREGORY**
	GRAMMAR	VERBS
	PRONUNICIATION	INTONATION
	READING COMPREHENSION	HAZRATH URS
	LANGUAGE SKILLS	SPEAKING : JAM
	VALUE ORIENTATION	SELF-DISCOVERY

DEPARTMENT OF ENGLISH
KAKATIYA UNIVERSITY
SYLLABUS FOR I YEAR (II SEMESTER) GENERAL ENGLISH
AT UNDERGRADUATE LEVEL
(under CBCS from 2019-2020)

UNIT ONE (SHORT FICTION)	**TEXT**	**WITH THE PHOTOGRAPHER by STEPHEN LEACOCK**
	GRAMMAR	PREPOSITIONS
	VOCABULARY	PREFIXES AND SUFFIXES
	READING COMPREHENSION	SPORTS, POLITICS AND DEMOCRACY by ARIO BIMO UTOMO
	PRONUNICATION	STRESS
	LANGUAGE SKILLS	INTRODUCING ONSELF IN FORMAL AND INFORMAL SITUATIONS
	SOFT SKILLS	LATERAL THINKING
UNIT TWO (PROSE)	**TEXT**	**A TREATISE ON GOOD MANNER AND GOOD BREEDING by JONATHAN SWIFT**
	GRAMMAR	CONJUNCTIONS
	VOCABULARY	SYNONYMS
	READING COMPREHENSION	THE ECONOMIC POWER OF LANGUAGE by GABRIELLE HOGAN-BRUN
	PRONUNICATION	STRESS AND PRACTICE IN PHONETIC TRANSCRIPTION
	LANGUAGE SKILLS	LISTENING COMPREHENSION

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Department of English
KAKATIYA UNIVERSITY
WARANGAL-506 009.

	SOFT SKILLS	ATTITUDE
UNIT THREE (POETRY)	**TEXT**	**ODE ON SOLITUDE by ALEXANDER POPE**
	GRAMMAR	KINDS OF SENTENCE
	SPELLING	PLURALS
	READING COMPREHENSION	JADAV PAYENG: THE FOREST MAN OF INDIA
	PRONUNCIATION	ASSIMILATION
	SOFT SKILLS	TEAM WORK
UNIT FOUR (DRAMA)	**TEXT**	**A MARRIAGE PROPOSAL by ANTON CHEKOV**
	GRAMMAR	COMMON MISTAKES
	PRONUNICIATION	ELISON
	READING COMPREHENSION	HOW I BECAME A PUBLIC SPEAKER? by GEORGE BERNARD SHAW
	LANGUAGE SKILLS	PRESENTATIONS
	VALUE ORIENTATION	SELF-CONFIDENCE

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Department of English
KAKATIYA UNIVERSITY
WARANGAL-506 009.

P. Nirmal
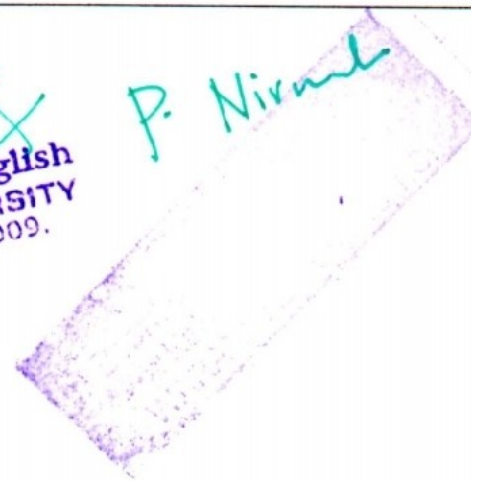
KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
Under Graduate Courses (Under CBCS 2020 – 2021 onwards)
B.A/B.COM/BBA/B.SC ENGLISH II YEAR
SEMESTER – III

PAPER – III: ENGLISH

Theory: 3 Hours/Week;   Credits: 3   Marks: 100 (Internal: 20; External: 80)

Prescribed Textbook entitled: English for Excellence
Published by Orient BlackSwan

UNIT I: GENDER EQUALITY

1. "Achieving Gender Equality in India: What Works, and What Doesn't" by Smriti Sharma
2. "They Shut me up in Prose" by Emily Dickinson
3. Prepositions
4. Phrasal Verbs

UNIT II: GENDER ROLES

1. "The Wonder Story of Kalpana Saroj" by Rakhi Chakraborthy
2. "The Kitchen" by Vimala
3. Voice
4. Technical Vocabulary

UNIT III: ENDING VIOLENCE AGAINST WOMEN

1. "What is my Name?" by P.Sathyavathi
2. "Voice of the Unwanted Girl" by Sujatha Bhatt
3. Connectives
4. Idioms

KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
Under Graduate Courses (Under CBCS 2020 – 2021 onwards)
B.A/B.COM/BBA/B.SC ENGLISH II YEAR
SEMESTER – IV

PAPER – IV: ENGLISH

Theory: 3 Hours/Week;   Credits: 3   Marks: 100 (Internal: 20; External: 80)

Prescribed Textbook entitled: English for Excellence
Published by Orient BlackSwan

UNIT I: RENEWABLE AND NON-RENEWABLE RESOURCES

1. Jadav Payeng
2. "The Tame Bird was in a Cage" by Rabindranath Tagore
3. Reported Speech
4. Commonly Confused Words

UNIT II: ECOSYSTEMS AND ENVIRONMENTAL POLLUTION

1. "Climate Change and Global Warming" by Michael Shafer
2. "A Requiem for Earth" by O.N.V.Kurup
3. Conditionals
4. Suffixes

UNIT III: CONSERVATION AND BIODIVERSITY

1. "The Ungrateful Man: A Conversation between Trees " by Swathi Shenoy
2. "The Felling of the Banyan Tree" by Dilip Chitre
3. Common Errors
4. Collocations

KAKATIYA UNIVERSITY - WARANGAL - TELANGANA

DEPARTMENT OF ENGLISH

Under Graduate Courses (Under CBCS 2021– 2022 onwards)

GENERAL ENGLISH III-YEAR, V- SEMESTER

B.A., B.COM., B.Sc., B.B.A., B.C.A.,B.A(L).
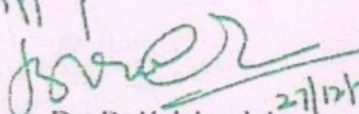
PAPER – V: ENGLISH

COMMUNICATION SKILLS

English through Human Values and Ethics
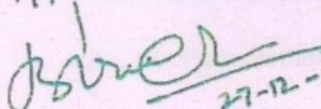
Theory: 3 Hours/Week; Credits: 3 Marks: 75 (Internal: 15; External: 60)

	PROSE	Tolerance is a Moral Virtue – Rivka T. Witenberg
Unit1	POEM	How Happy is the Little Stone – Emily Dickinson
	LANGUAGE	Paragraph Writing
	PROSE	When Cities were Nature's Haven -- Harini Nagendra
Unit 2	POEM	Where the Mind is Without Fear – Rabindranath Tagore
	LANGUAGE	Note-making
	PROSE	Why we Love Holiday Rituals and Traditions – Dimitris Xygalatas
Unit 3	POEM	Sonnets are Full of Love – Christina Rossetti
	LANGUAGE	Public Speaking

PRESCRIBED TEXTBOOK: *English for Career*: A Course book for Undergraduate Learners

Eds. K. Purushotham, M. Rajeshwar and R. Meghana Rao. Published by Orient Blackswan.2021.

Approved

27-12-2021
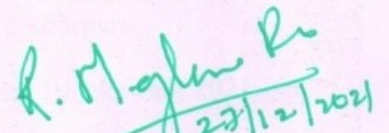
Dr. B. Krishnaiah

EXTERNAL MEMBER

Dr. B. KRISHNAIAH
Assistant Professor
Department of English
School of Humanities
University of Hyderabad
Hyderabad-500 046.
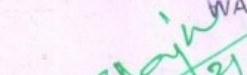
Ms. P. Nirmala

HEAD
Department of English
KATIYA UNIVERSITY
Warangal-506 009.

27/12/2021

Dr. R. Meghana Rao
Chairperson
Board of Studies In English
Kakatiya University
WARANGAL-506 009.

KAKATIYA UNIVERSITY - WARANGAL -TELANGANA

DEPARTMENT OF ENGLISH

Under Graduate Courses (Under CBCS 2021– 2022 onwards)

GENERAL ENGLISH III-YEAR, VI- SEMESTER

B.A., B.Com. B.Sc., B.B.A., ~~B.B.M~~, B.A(L).

PAPER – VI : ENGLISH

COMMUNICATION SKILLS

English for Employability skills
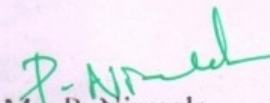
Theory: 3 Hours/Week; Credits: 3; Marks: 75 (Internal: 15; External: 60)

	PROSE	Sreelakshmi Suresh
Unit 1	POEM	For whom the Bell Tolls – John Donne
	LANGUAGE	Official Letters
	PROSE	How Work can be Made Meaningful – Katie Bailey
Unit 2	POEM	Teamwork – Edgar Albert Guest
	LANGUAGE	Job Application Letters and Curriculum Vitae
	PROSE	How the Corona-virus Sparked a Wave of Innovation – Sreevas Sahasranamam
Unit 3	POEM	See it through – Edgar Albert Guest
	LANGUAGE	Email etiquette

PRESCRIBED TEXTBOOK: *English for Careers*: A Course book for Undergraduate Learners

Eds. K. Purushotham, M. Rajeshwar and R. Meghana Rao. Published by Orient Blackswan, 2021.

Approved

27/12/2021

Dr. B. Krishnaiah

Dr. B. KRISHNAIAH
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Ms. P. Nirmala
HEAD
Department of English
KATIYA UNIVERSITY
Warangal-506 009.
27/12/2021

Chairperson
Board of Studies in English
Kakatiya University
WARANGAL-506 009.
27/XII/21

C.B.C.S Pattern Syllabus from 2019-2010 onwards
B.A., B.Sc., B.Com. & B.BA
1st Semester IInd Languages - Telugu

Unit -I ప్రాచీన కవిత్వం

1) శకుంతలోపాఖ్యానం- నన్నయ

2) గోదగూచి కథ – పాల్కురికి సోమనాధుడు

3) సంవరణుడి తపస్సు-అద్దంకి గంగాధరుడు

Unit -II ఆధునిక కవిత్వం

1) కాసులు–గురజాడ అప్పారావు

2) రాజు–కవి–డా.గుత్తం జాషువా

3) గంగిరెద్దు–డా। పల్లా దుర్గయ్య

4) జయభేరి–శ్రీ. శ్రీ.

Unit -III వచన కవిత్వం

రుద్రమదేవి (నవల) – ఒద్దిరాజు సోదరులు

Unit -IV భాషా భాగాలు–వ్యాకరణం

పర్యాయ పదాలు, నానార్థాలు, సంధులు, సమాసాలు, తెలుగు వాక్యం

C.B.C.S Pattern Syllabus from 2019-2010 onwards
B.A., B.Sc., B.Com. & B.B.A.
2nd Semester IInd Languages - Telugu

Unit -I   ప్రాచీన కవిత్వం

1)   గజేంద్ర మోక్షం–పోతన

2)   హనుమత్ సందేశం–మొల్ల

3)   సుభాషితాలు–ఏనుగు లక్ష్మణ కవి

Unit -II   ఆధునిక కవిత్వం

1)   స్నేహలత లేఖ–రాయప్రోలు సుబ్బారావు

2)   అంతర్నాదం–దాశరథి కృష్ణమాచార్యులు

3)   ప్రపంచపదులు–డా॥ సి.నారాయణరెడ్డి

4)   అల్విదా–కౌముది

Unit -III   వచన విభాగం

1)   యుగాంతం–నెల్లూరి కేశవ స్వామి

2)   ఎంకన్న – ఆచార్య పాకాల యశోదారెడ్డి

3)   మామిడి పండు – సురవరం ప్రతాపరెడ్డి

4)   మా ఊరుపోయింది–దేవులపల్లి వేంకట కృష్ణశాస్త్రి

Unit -IV   ఛందస్సు

ఉత్పలమాల, చంపకమాల, శార్దూలం, మత్తేభం, ఆటవెలది, తేటగీతి, ద్విపద, సీసం, కందం, ఉత్సాహం, తరళం, స్రగ్ధర, మహాస్రగ్ధర, ముత్యాలసరం

KAKATIYA UNIVERSITY, WARANGAL
B.A., B.Sc., B.Com. & B.B.A (CBCS)
Syllabus - 2020
Telugu (Second Language)
3rd Semester

Unit -I   ప్రాచీన పద్యభాగం

1) ధర్మజుని వాక్చాతుర్యం   —   తిక్కన
2) విభీషణ శరణాగతి   —   గోన బుద్ధారెడ్డి
3) గుణనిధి కథ   —   శ్రీనాథుడు

Unit -II   ఆధునిక పద్యభాగం

1) రైతు ప్రశస్తి   —   వానమామలై జగన్నాథాచార్యులు
2) గురుదక్షిణ   —   అంబటి లక్ష్మీనరసింహరాజు
3) గుడిసెలు కాలిపోతున్నె   —   డా॥ బోయి భీమన్న

Unit -III   అలంకారాలు

శబ్దాలంకారాలు: వృత్త్యను‍ప్రాస,ఛేకాను‍ప్రాస, లాటాను‍ప్రాస, అంత్యాను‍ప్రాస,యమకం, ముక్తపద‍గ్రస్తాలంకారాలు

అర్థాలంకారాలు: ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, ఉల్లేఖ, అర్థాంతరవ్యాస, శ్లేష, దృష్టాంతాలంకారాలు

పాఠ్యగ్రంథం: తెలుగు అకాడమీ వారి "సాహితీ కిన్నెర" తెలుగు వాచకం

29/8/2020
Chairman
Board of Studies in Telugu
KAKATIYA UNIVERSITY
WARANGAL-T.P.

Head
Department of Telugu
Kakatiya University
Warangal-506 09(T.S.).

KAKATIYA UNIVERSITY, WARANGAL
B.A., B.Sc., B.Com. & B.B.A (CBCS)
Syllabus - 2020
Telugu (Second Language)
4th Semester

Unit -I ప్రాచీన పద్యభాగం

1) నారద గానమాత్సర్యం – పింగళి సూరన

2) వాగ్దాన భంగం – అసూరి మరింగంటి వేంకట నరసింహాచార్యులు

3) నారసింహ శతకం – ధర్మపురి శేషప్ప

Unit -II ఆధునిక పద్యభాగం

1) నరుడ నేను, నరుడ నేను – కాళోజీ

2) ఆ ౹ ్రతగీతం – దేవరకొండ బాలగంగాధర తిలక్

3) దేవరకొండ దుర్గం – డా॥ ముకురాల రామారెడ్డి

Unit -III వచన విభాగం

1) అర్ధరాత్రి అరుణోదయం – దాశరథి రంగాచార్య

2) సి.పి బ్రౌన్ సాహిత్య సేవ – జానమద్ది హనుమచ్ఛాస్త్రి

3) మన గ్రామ నామాలు – డా॥ కపిలవాయి లింగమూర్తి

4) నివురు తొలగిన నిప్పు – పోల్కంపల్లి శాంతాదేవి

5) కొండమల్లెలు – ఇల్లిందల సరస్వతీదేవి

పాఠ్యగ్రంథం: తెలుగు అకాడమీ వారి "సాహితీ కిన్నెర" తెలుగు వాచకం

29-8-2020

Chairman
Board of Studies in Telugu
KAKATIYA UNIVERSITY
WARANGAL-A.P.

Head
Department of Telugu
Kakatiya University
Warangal-506 09(T.S.).

KAKATIYA UNIVERSITY, WARANGAL
B.A., B.Sc., B.Com. & B.B.A (CBCS)
Syllabus - 2021-2022
Telugu (Second Language)
5th Semester

Unit -I   కవితా ప్రక్రియలు

1) పద్యం

2) పాట

3) వచన కవిత

4) మినీ కవితా రూపాలు,
   హైకూ, నానీలు మినీ కవితలు

5) రుబాయిలాు, గజల్

Unit -II   తెలుగు వ్యాసం

6) వ్యాసం నిర్వచనం, లక్షణాలు

7) తెలుగు వ్యాస పరిణామక్రమం

8) వ్యాస రచనా పద్ధతులు

9) వ్యాస రచన భాషా ప్రయోగాలు

10) వ్యాసం –వస్తు వైవిధ్యం

Unit -III   వచన సాహిత్యం

11) అధ్యయన–సంస్కృతి

12) సాహిత్య అధ్యయనం ప్రయోజనాలు

13) ముందుమాట

14) పుస్తక సమీక్ష

15) జానపద సాహిత్య పరిచయం

Unit -I సాహిత్య ప్రక్రియల పరిచయం

1) నాటకం

2) నవల

3) కథానిక

4) జీవిత చరిత్ర

5) ఉపన్యాస కళ
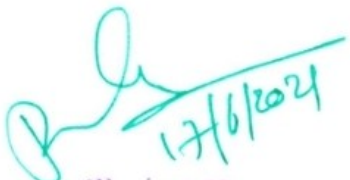
Unit -II జర్నలిజంలో మౌలికాంశాలు

6) వార్త – నిర్వచనం, లక్షణాలు

7) లీడ్ – ఎడిటింగ్

8) వార్తా కథనాలు

9) అనువాదం

10) ఇంటర్వ్యూలు

Unit -III ప్రాజెక్టు పరిచయం

11) ప్రాజెక్టు

12) అధ్యయనం

13) పరికల్పన

14) నివేదిక

2.1 Differential and Integral Calculus

DSC-1A   **BS:101**

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The course is aimed at exposing the students to some basic notions in differential calculus.

Outcome: By the time students complete the course they realize wide ranging applications of the subject.

Unit- I

Partial Differentiation: Introduction - Functions of two variables - Neighbourhood of a point (a, b) - Continuity of a Function of two variables, Continuity at a point - Limit of a Function of two variables - Partial Derivatives - Geometrical representation of a Function of two Variables - Homogeneous Functions.

Unit- II

Theorem on Total Differentials - Composite Functions - Differentiation of Composite Functions - Implicit Functions - Equality of $f_{xy}(a, b)$ and $f_{yz}(a, b)$ - Taylor's theorem for a function of two Variables - Maxima and Minima of functions of two variables – Lagrange's Method of undetermined multipliers.

Unit- III

Curvature and Evolutes: Introduction - Definition of Curvature - Radius of Curvature - Length of Arc as a Function, Derivative of arc - Radius of Curvature - Cartesian Equations - Newtonian Method - Centre of Curvature - Chord of Curvature.

Evolutes: Evolutes and Involutes - Properties of the evolute.

Envelopes: One Parameter Family of Curves - Consider the family of straight lines - Definition - Determination of Envelope.

Unit- IV

Lengths of Plane Curves: Introduction - Expression for the lengths of curves $y = f(x)$ - Expressions for the length of arcs $x = f(y); x = f(t), y = \varphi(t); r = f(\theta)$

Volumes and Surfaces of Revolution: Introduction - Expression for the volume obtained by revolving about either axis - Expression for the volume obtained by revolving about any line - Area of the surface of the frustum of a cone - Expression for the surface of revolution - Pappus Theorems - Surface of revolution.

Text:

- Shanti Narayan, P.K. Mittal *Differential Calculus, S.CHAND, NEW DELHI*

- Shanti Narayan *Integral Calculus, S.CHAND, NEW DELHI*

References:

4

- William Anthony Granville, Percey F Smith and William Raymond Longley; *Elements of the differential and integral calculus*

- Joseph Edwards , *Differential calculus for beginners*

- Smith and Minton, *Calculus*

- Elis Pine, *How to Enjoy Calculus*

- Hari Kishan, *Differential Calculus*

2.2 Differential Equations

DSC-1B   **BS:201**

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The main aim of this course is to introduce the students to the techniques of solving differential equations and to train to apply their skills in solving some of the problems of engineering and science.

Outcome: After learning the course the students will be equipped with the various tools to solve few types differential equations that arise in several branches of science.

Unit- I
Differential Equations of first order and first degree: Introduction - Equations in which Variables are Separable - Homogeneous Differential Equations - Differential Equations Reducible to Homogeneous Form - Linear Differential Equations - Differential Equations Reducible to Linear Form - Exact differential equations - Integrating Factors - Change in variables - Total Differential Equations - Simultaneous Total Differential Equations - Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$.

Unit- II
Differential Equations first order but not of first degree: Equations Solvable for p - Equations Solvable for y - Equations Solvable for x - Equations that do not contain x (or y)- Equations Homogeneous in x and y - Equations of the First Degree in x and y - Clairaut's equation.
Applications of First Order Differential Equations : Growth and Decay - Dynamics of Tumour Growth - Radioactivity and Carbon Dating - Compound Interest - Orthogonal Trajectories

Unit- III
Higher order Linear Differential Equations: Solution of homogeneous linear differential equations with constant coefficients - Solution of non-homogeneous differential equations $P(D)y = Q(x)$ with constant coefficients by means of polynomial operators when $Q(x) = be^{ax}, b\sin ax/b\cos ax, bx^k, Ve^{ax}$ - Method of undetermined coefficients.

Unit- IV
Method of variation of parameters - Linear differential equations with non constant coefficients - The Cauchy - Euler Equation - Legendre's Linear Equations - Miscellaneous Differential Equations.
Partial Differential Equations: Formation and solution- Equations easily integrable - Linear equations of first order.

Text:

- Zafar Ahsan,*Differential Equations and Their Applications*

References:

- Frank Ayres Jr, *Theory and Problems of Differential Equations.*

- Ford, L.R ; *Differential Equations.*

- Daniel Murray, *Differential Equations.*

- S. Balachandra Rao, *Differential Equations with Applications and Programs.*

- Stuart P Hastings, J Bryce McLead; *Classical Methods in Ordinary Differential Equations.*

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KAKATIYA UNIVERSITY - WARANGAL - TELANGANA
Under Graduate Courses (w.e.f. academic year 2019-20 batch onwards)
B.Sc. MATHEMATICS II Year
SEMESTER – III

REAL ANALYSIS
Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The course is aimed at exposing the students to the foundations of analysis which will be useful in understanding various physical phenomena.

Outcome: After the completion of the course students will be in a position to appreciate beauty and applicability of the course.

UNIT- I
Sequences: Limits of Sequences- A Discussion about Proofs-Limit Theorems for Sequences- Monotone Sequences and Cauchy Sequences -Subsequences-Limit sup's and Limit inf's - Series- Alternating Series and Integral Tests.

UNIT- II
Continuity: Continuous Functions -Properties of Continuous Functions -Uniform Continuity - Limits of Functions

UNIT- III
Differentiation: Basic Properties of the Derivative - The Mean Value Theorem - L'Hospital Rule - Taylor's Theorem.

UNIT- IV
Integration: The Riemann Integral - Properties of Riemann Integral-Fundamental Theorem of Calculus.

Text:

Kenneth A Ross, Elementary Analysis-The Theory of Calculus

References:

1] S.C. Malik and Savita Arora, Mathematical Analysis, Second Edition, Wiley
   Eastern Limited, New Age International (P) Limited, New Delhi, 1994.
2] William F. Trench, Introduction to Real Analysis

3] Lee Larson , Introduction to Real Analysis I

4] Shanti Narayan and Mittal, Mathematical Analysis

5] Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner; Elementary Real analysis

6] Sudhir R., Ghorpade, Balmohan V., Limaye; A Course in Calculus and Real Analysi

Chairperson Board of Studies in Mathematics, Kakatiya University, Warangal,

ALGEBRA

Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The course is aimed at exposing the students to learn some basic algebraic structures like groups, rings etc.

Outcome: On successful completion of the course students will be able to recognize algebraic structures that arise in matrix algebra, linear algebra and will be able to apply the skills learnt in understanding various such subjects.

UNIT- I

Groups: Definition and Examples of Groups- Elementary Properties of Groups-Finite Groups - Subgroups -Terminology and Notation -Subgroup Tests - Examples of Subgroups.
Cyclic Groups: Properties of Cyclic Groups - Classification of Subgroups Cyclic Groups.

UNIT- II

Permutation Groups: Definition and Notation -Cycle Notation-Properties of Permutations -A

Check Digit Scheme Based on D5. Isomorphisms ; Motivation- Definition and Examples - Cayley's Theorem Properties of Isomorphisms -Automorphisms-Cosets and Lagrange's Theorem Properties of Cosets 138 - Lagrange's Theorem and Consequences-An Application of Cosets to Permutation Groups -The Rotation Group of a Cube and a Soccer Ball.

UNIT- III

Normal Subgroups and Factor Groups: Normal Subgroups-Factor Groups -Applications of Factor Groups -Group Homomorphisms - Definition and Examples -Properties of Homomorphisms -The Fifirst Isomorphism Theorem.

Introduction to Rings: Motivation and Definition -Examples of Rings -Properties of Rings - Subrings.

Integral Domains: Definition and Examples - Fields Characteristics of a Ring.

UNIT- IV

Ideals and Factor Rings: Ideals -Factor Rings -Prime Ideals and Maximal Ideals.
Ring Homomorphisms: Definition and Examples-Properties of Ring-
Homomorphisms.

Text:
  Joseph A Gallian, Contemporary Abstract algebra (9th edition)
References:
  1] Bhattacharya, P.B Jain, S.K.; and Nagpaul, S.R,Basic Abstract Algebra 2]
  Fraleigh, J.B, A Fifirst Course in Abstract Algebra.
  3] Herstein, I.N, Topics in Algebra
  4] Robert B. Ash, Basic Abstract Algebra
  5] I Martin Isaacs, Finite Group Theory
  6] Joseph J Rotman, Advanced Modern Algebra

Linear Algebra

(w.e.f. academic year 2019-20 batch onwards)

DSC-V

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The students are exposed to various concepts like vector spaces, bases, dimension, Eigen values etc.

Outcome: After completion this course students appreciate its interdisciplinary nature.

Unit- I

Vector Spaces: Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems -The Dimension of a Vector Space

Unit- II

Rank-Change of Basis - Eigenvalues and Eigenvectors - The Characteristic Equation

Unit- III

Diagonalization: -Eigenvectors and Linear Transformations -Complex Eigenvalues - Applications to Differential Equations.

Unit- IV
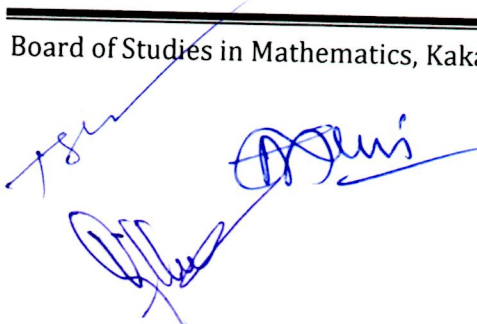
Orthogonality and Least Squares : Inner Product, Length, and Orthogonality -Orthogonal Sets -Orthogonal Projections - The Gram-Schmidt Process.

Text:

David C Lay, Linear Algebra and its Applications 4e

References:

1] S Lang, Introduction to Linear Algebra

2] Gilbert Strang , Linear Algebra and its Applications

3] Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; Linear Algebra

4] Kuldeep Singh; Linear Algebra.

5] Sheldon Axler; Linear Algebra Done Right

Chairperson, BOS
Department of Mathematics
University College
Kakatiya University, Warangal.

(A) Numerical Analysis

(w.e.f. academic year 2019-20 batch onwards)

DSE-VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be made to undefirstand some methods of numerical analysis.
Outcome: Students realize the importance of the subject in solving some problems of algebra and calculus.

Unit- I

Errors in Numerical Calculations - Solutions of Equations in One Variable: The Bisection Method - The Iteration Method - The Method of False Position-Newton's Method - Muller's Method - solution of Systems of Nonlinear Equations.

Unit- II

Interpolation and Polynomial Approximation: Interpolation - Finite Differences - Differences of Polynomials - Newton's formula for Interpolation - Gauss's central differences formulae - Stirling's and Bessel's formula - Lagrange's Interpolation Polynomial - Divided differences - Newton's General Interpolation formula - Inverse Interpolation.

Unit- III

Curve Fitting: Least Square Curve Fitting: Fitting a Straight Line-Nonlinear Curve Fitting. **Numerical Differentiation and Integration:** Numerical Differentiation - Numerical Integration: Trapezoidal Rule-Simpson's 1/3rd-Rule and Simpson's 3/8th-Rule - Boole's and Weddle's Rule - Newton's Cotes Integration Formulae.

Unit- IV

Numerical Solutions of Ordinary Differential Equations: Taylor's Series Method - Picard's Method - Euler's Methods - Runge Kutta Methods.

Text:

S.S.Sastry,Introductory Methods of Numerical Analysis, PHI

References:

1] Richard L. Burden and J. Douglas Faires,Numerical Analysis (9e)

2] M K Jain, S R K Iyengar and R K Jain, Numerical Methods for Scientific and Engineering computation

3] B.Bradie , A Friendly introduction to Numerical Analysis

(B) Integral Transforms

(w.e.f. academic year 2019-20 batch onwards)

DSE - VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be exposed to Integral Transforms. The students also learning the Applications of Laplace Transforms to Differential Equations which arises in Physics and Engineering Problems.

Outcome: Students apply their knowledge to solve some problems on special functions and Differential Equations by using the Integral Transforms.

Unit- I

Laplace Transforms-Definition-Existence theorem-Laplace transforms of derivatives and integrals Periodic functions and some special functions.

Unit- II

Inverse Transformations - Convolution theorem - Heaviside's expansion formula.

Unit- III

Applications to ordinary Differential equations - solutions of simultaneous ordinary Differential equations - Applications to Partial Differential equations.

Unit- IV

Fourier Transforms- Sine and cosine transforms-Inverse Fourier Transforms.

Text:

Vasishtha and Gupta, Integral Transforms, Krishna Prakashan Media(P), Ltd, Meerut (2e)

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Chairperson, BOS
Department of Mathematics
University College
Kakatiya University, Warangal.

(C) Analytical Solid Geometry

(w.e.f. academic year 2019-20 batch onwards)

DSE - VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students learn to describe some of the surfaces by using analytical geometry.
Outcome: Students understand the beautiful interplay between algebra and geometry.

Unit- I
Sphere: Definition-The Sphere Through Four Given Points-Equations of a Circle- Intersection of a Sphere and a Line-Equation of a Tangent Plane-Angle of Intersection of Two Spheres-Radical Plane.

Unit- II
Cones and Cylinders: Definition-Condition that the General Equation of second degree Represents a Cone-Cone and a Plane through its Vertex -Intersection of a Line with a Cone.

Unit- III
The Right Circular Cone-The Cylinder- The Right Circular Cylinder.

Unit- IV
The Conicoid: The General Equation of the Second Degree-Intersection of Line with a Conicoid-Plane of contact-Enveloping Cone and Cylinder.

Text:

Shanti Narayan and P K Mittal, Analytical Solid Geometry (17e)

References:

1] Khaleel Ahmed, Analytical Solid Geometry

2] S L Loney , Solid Geometry

3] Smith and Minton, Calculus

DSC-1/Paper-1: **Descriptive Statistics and Probability**
[4 HPW:: 4 Credits :: 100 Marks (External:80, Internal:20)]

Unit-I

Descriptive Statistics: Concepts of primary and secondary data, Methods of collection, Editing of primary data, Designing a questionnaire and a schedule, Sources and editing of secondary data, Classification and tabulation of data, Measures of central tendency (Arithmetic Mean, Median, Mode, Geometric Mean and Harmonic Mean) with simple applications, Absolute and relative measures of dispersion (Range, Quartile Deviation, Mean Deviation, Standard Deviation and Variance) with simple applications, Moments and their Importance, Central and Non-central Moments, their inter-relationships, Sheppard's correction for moments for grouped data, Measures of Skewness based on quartiles and moments, Kurtosis based on moments.

Unit-II

Probability: Basic concepts, deterministic and random experiments, trial, outcome, sample space, event, operations on events, mutually exclusive and exhaustive events, equally likely and favourable events, examples. Mathematical, Statistical and Axiomatic definitions of probability, their merits and demerits. Properties of probability based on axiomatic definition, Conditional probability and independence of events, Addition and multiplication theorems for 'n'(≥ 2) events, Boole's inequality and Bayes' theorem, Problems on applications of Bayes' theorem.

Unit-III

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function (pmf), probability density function (pdf) with illustrations, Probability Distribution function and its properties, Transformation of one-dimensional random variable (simple 1-1 functions only), Notion of bi-variate random variable, bi-variate distribution and its properties , Joint, marginal and conditional distributions, Independence of random variables.

Unit-IV

Mathematical Expectation: Expectation of random variable, a function of a random variable, Raw and Central moments, Covariance using mathematical expectation (examples), Addition and multiplication theorems of expectation, Definitions of moment generating function (m.g.f), characteristic function (c.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and their properties, Chebyshev's and Cauchy-Schwartz's inequalities and their applications.

References:
1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
3. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
4. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI

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Practical-1
Descriptive Statistics and Probability
(3 HPW :: 1 Credit :: 25 Marks)

Part-1 (Using Calculator)

1. Graphical presentation of data (Histogram, frequency polygon, Ogives). s
2. Diagrammatic presentation of data (Bar and Pie).
3. Computation of non-central and central moments – Sheppard□s corrections for grouped data.
4. Computation of coefficients of Skewness and Kurtosis □ Karl Pearson's, Bowley's, β_1 and β_2.

Part-2 (Using MS-Excel)

1. Basics of Excel- data entry, editing and saving, establishing and copying formulae, built in Functions in excel, copy and paste and exporting to MS word document.
2. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS-Excel
3. Diagrammatic presentation of data (Bar and Pie) using MS-Excel
4. Computation of Measures of central tendency, dispersion, Coefficient of Variation and coefficients of Skewness, Kurtosis using MS-Excel.

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DSC-2/Paper-2: **Probability Distributions**
[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Unit-I

Discrete distributions-I: Uniform and Bernoulli distributions and their properties, functions and properties such as mean, median, mode, moments upto fourth order, moment generating function(m.g.f), cumulants upto fourth order, cumulant generating function(c.g.f), mean, variance and simple examples, derivation of probability mass(p.m.f), probability generating function(p.g.f), characteristic function(c.f), reproductive property (wherever exists) and their real life applications of of: Binomial distribution, Poisson distribution. Poisson approximation to Binomial distribution.

Unit-II

Discrete distributions-II: Negative binomial, Geometric, Hyper-geometric distribution distributions and their properties, Definitions and real life applications, properties of these distributions such as mean, variance, m.g.f, c.g.f., p.g.f., c.f. and moments upto fourth order, reproductive property (wherever exists), lack of memory property for Geometric distribution, Poisson approximation to Negative binomial distribution, Binomial approximation to Hyper-geometric distribution.

Unit-III

Continuous distributions-I: Rectangular and Normal distributions: definition, properties such as mean, variance, moments upto fourth order, m.g.f., c.g.f., c.f., reproductive property (wherever exists) and their real life applications. Normal distribution as a limiting case of Binomial and Poisson distributions. All properties of Normal distribution with examples.

Unit-IV

Continuous distributions-II: Exponential, Gamma distributions: definition, properties, m.g.f., c.g.f., c.f. and moments upto fourth order, reproductive property (wherever exists) and their real life applications. Beta distribution of two kinds: Definitions, mean and variance. Cauchy distribution, its definition and c.f.

Definition of convergence in Law, Convergence in Probability and Almost sure convergence. Definitions of Weak Law of Large Numbers (WLLN), Strong Law of Large numbers (SLLN), Central Limit Theorem (CLT) with simple examples. CLT for identically and independently distributed (i.i.d) random variables with finite variance.

References:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
3. Goon A M, Gupta M K, Das Gupta B : Fundamentals of Statistics, (Vol-I), The World Press (Pvt) Ltd., Kolkata.
4. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI

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Practical-2
Probability Distributions
(3 HPW :: 1 Credit :: 25 Marks)

Part-1 (Using Calculator)

1. Fitting of Binomial distribution-Direct method.
2. Fitting of Binomial distribution-Recurrence relation Method.
3. Fitting of Poisson distribution-Direct method
4. Fitting of Poisson distribution-Recurrence relation Method.
5. Fitting of Negative Binomial distribution.
6. Fitting of Geometric distribution.
7. Fitting of Normal distribution-Areas method.
8. Fitting of Normal distribution - Ordinates method.

Part-2 (Using MS-Excel)

1. Fitting of Binomial distribution-Direct method.
2. Fitting of Poisson distribution-Direct method.
3. Fitting of Normal distribution-Areas method.
4. Fitting of Exponential distribution.
5. Fitting of Cauchy distribution.

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KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2020-2021 on words)
B.Sc. STATISTICS
II Year: Semester-III

DSC-3/Paper-3: STATISTICAL METHODS AND THEORY OF ESTIMATION

[4 HPW:: 4 Credits :: 100 Marks (External:80, Internal:20)]

Unit-I

Bi-variate data, Scattered diagram, Principle of least squares, fitting of straight line, quadratic and power curves. Concept of correlation, computation of Karl-Pearson correlation coefficient for grouped and ungrouped data and its properties, Correlation ratio, Spearman's rank correlation coefficient and its properties. Simple linear regression, correlation verses regression, properties of regression coefficients, their relation with correlation coefficient.

Unit-II

Concepts of partial and multiple correlation coefficients (only for three variables), Analysis of categorical data, their independence, Association and partial association of attributes, various measures of association, Yule's for two way data, coefficient of contingency (Pearson and Tcherprow), coefficient of colligation.

Unit-III

Concepts of Population, Parameter, Random sample, Statistic, Sampling distribution and Standard error, Standard error of sample means and that of sample proportions, Exact sampling distributions: Statement and properties of χ^2, t and F distributions and their inter-relationships. Independence of sample mean and variance in random sampling from normal distribution.
Point estimation of a parameter, concept of bias and mean square error of an estimate. Criteria of a good estimator: consistency, unbiasedness, efficiency and sufficiency with examples.

Unit – IV

Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions, Estimation by the method of moments(MOM), Maximum likelihood estimation (MLE), Asymptotic properties of MLE (Statements without proofs), Concept of interval estimation, Confidence intervals of the parameters of normal population by Pivot method.

References:

1. Goon AM, Gupta MK, Das Gupta B : Outlines of Statistics , Vol-II,

   The World Press Pvt. Ltd., Kolkata.

2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics,

   Sultan Chand & Sons, New Delhi.

3. Hogg and Craig : Introduction to Mathematical statistics. Prentice Hall

4. Parimal Mukhopadhyay : Mathematical Statistics, New Central Book agency.

5. V. K. Rohatgi and A. K. Md. Ehsanes Saleh : An introduction to probability and statistics, Wiley series.

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KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2020-2021 on words)
B.Sc. STATISTICS
II Year: Semester-III

Practical-3: *STATISTICAL METHODS AND THEORY OF ESTIMATION*
(3 HPW, Credits 1 and Marks 25)

Part-A (Using Calculator)

1. Generation of random samples from Uniform (0,1), Uniform (a,b), Normal and Poisson and Exponential Distributions.

2. Fitting of straight line and parabola by the method of least squares.

3. Fitting of power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ by the method of least squares.

4. Computation of Yule's coefficient of association and Pearson's, Tcherprows coefficient of contingency.

5. Computation of correlation coefficient and regression lines for ungrouped data.

6. Computation of correlation coefficient, forming regression lines for ungrouped data.

7. Computation of correlation coefficient, forming regression lines for grouped data.

8. Computation of multiple and partial correlation coefficients.

9. Computation of correlation ratio

Part-B (Using MS-Excel)

10. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions using MS Excel.

11. Fitting of straight line and parabola by the method of least squares using MS Excel.

12. Fitting of power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ by the method of least squares using MS Excel.

13. Computation of correlation coefficient, forming regression lines using MS Excel.

14. Computation of multiple and partial correlation coefficients using MS Excel.

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DSC-4/Paper-4: STATISTICAL INFERENCE
[4 HPW: 4 Credits: 100 Marks (External: 80, Internal: 20)]

Unit-I

Concepts of statistical hypotheses: Null and Alternative hypothesis, Critical region, two types of error, Level of significance and Power of a test, One and two tailed tests, test function (non-randomized and randomized), Statement and Proof of Neyman-Pearson's fundamental lemma for Randomized tests, Examples in case of Binomial, Poisson, Exponential and Normal distributions and their power of the test functions.

Unit-II

Large sample tests: Large sample tests for single sample mean, difference of means, single sample proportion, difference of proportions and difference of standard deviations. Fisher's Z-transformation for population correlation coefficient(s) and testing the same in case of one sample and two samples, Definition of "Order Statistics" and their distributions (statements only).

Unit-III

Tests of significance: Tests based on χ^2 distribution, χ^2-test for specified variance, goodness of fit and test for independence of attributes (rxs, 2xk and 2x2 contingency tables). Tests of significance based on student's t distribution, t-test for single sample specified mean, difference of means for independent and related samples, sample correlation coefficient, F-test for equality of population variances.

Unit-IV

Non-parametric tests: Various non-parametric tests. their advantages and disadvantages, comparison with parametric tests, Measurement scale: nominal, ordinal, interval and ratio, Use of Central Limit Theorem in testing, one sample runs test, sign test and Wilcoxon-signed rank test (single and paired samples). Two independent sample tests: Median test, Wilcoxon-Mann-Whitney U-test, Wald Wolfowitz's runs test. Use of central limit theorem in testing.

References:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi
3. Hogg and Craig : Introduction to Mathematical statistics, Prentice Hall
4. Parimal Mukhopadhyay : Mathematical Statistics, New Central Book agency.

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Practical-4: STATISTICAL INFERENCE

[3 HPW, Credits 1 and Marks 25]

Part-A (Using Calculator)

1. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.
2. Small sample tests for single mean and difference of means and correlation coefficient.
3. Paired t-test.
4. Small sample test for single and difference of variances.
5. χ^2 – test for goodness of fit and independence of attributes.
6. Nonparametric tests for two independent samples (Median test, Wilcoxon-Mann-Whitney U-test, Wald - Wolfowitz's runs test)

Part-B (Using MS-Excel)

7. Use of Look up and Reference functions for data analysis.
8. Creating and assigning Macros.
9. Small sample tests for mean(s), paired t-test and correlation coefficient using MS Excel.
10. Small sample test for single and difference of variances using MS Excel.
11. χ^2 – test for goodness of fit and independence of attributes using MS Excel.
12. Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample runs test.

Note: Training shall be on establishing formulae in Excel cells and deriving the results.
The Excel output shall be exported to MS-Word for writing inferences.

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KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2021-2022 onwards)
B.Sc. STATISTICS
III Year :: Semester-V

DSE-1(A)/Paper-5 (A): Applied Statistics-I
[4 HPW:: 4 Credits :: 100 Marks (External : 80, Internal : 20)]

UNIT-I

Sample Surveys: Concepts of population, sample, sampling unit, parameter, statistic, sample frame and standard error. Principal steps in sample surveys - need for sampling, census versus sample surveys, sampling and non- sampling errors, sources and treatment of non-sampling errors, advantages and limitations of sampling.

Sampling Methods: Types of sampling: Subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in Simple Random Sampling With and Without Replacement

UNIT-II

Estimates of population mean, population total, and population proportion, their variances and the estimates of variances in methods of: (i) Stratified Random Sampling with Proportional and Neyman allocation (ii) Systematic Sampling when N= nk, Comparison of relative efficiencies, Advantages and disadvantages of SRS, Stratified and Systematic sampling methods.

UNIT-III

Time Series: Time Series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares and moving average methods. Growth curves and their fitting with reference to Modified exponential, Gompertz and Logistic curves. Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

UNIT-IV

Statistical Quality Control: Importance of SQC in industry, Dimensions of quality, Statistical basis of Shewart control charts. Construction of control charts for variables: mean, range and standard deviation, Construction of control charts for attributes: p, np with fixed and varying sample sizes and their interpretation, c and u charts with fixed and varying sample sizes and their interpretation.

References:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Sanjay Arora and Bansilal :New Mathematical Statistics, Satya Prakashan , New Delhi
3. Hogg and Craig : Introduction to Mathematical statistics, Prentice Hall
4. Parimal Mukhopadhyay : Mathematical Statistics, New Central Book agency.
5. Anuvartita Sankhyaka Sastram , Telugu Academy.

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Practical-5 (A) : Applied Statistics - I
[With 3 HPW, Credits 1 and 25 Marks]

Practical (using R-Software and MS- Excel)

R- Software : Overview of R, R data types and objects, reading and writing data, sub setting R Objects, Essentials of the R Language, Running R, Packages in R, Variable names and assignment, Operators, Integers, Factors, Logical operations. Operations of Scalars, Vectors, Lists, Arrays, Matrices, Data Frames. Control structures, Functions.

1. Data Visualization using R - Frequency polygons and curves, Ogives, Histogram using R.

2. Data Visualization using R - Bar diagrams (simple, compound, percentage and multiple) and Pie diagram (single and multiple) using R.

3. Computation of Descriptive Statistics using R (Measures of Central tendencies and Dispersion, Moments, Skewness and Kurtosis) using R.

4. Computation of expected frequencies for Binomial, Poisson, Normal and Exponential distributions using R.

5. Computation of Karl Pearson's coefficient of correlation and rank correlation using R.

6. Computation of partial and multiple correlations using R.

7. Time series Analysis: Computation of Secular trend by least squares and moving averages methods using R and MS-Excel.

8. Computation of Seasonal variations by Ratio to moving averages, Ratio to trend and Link Relatives methods using R and MS-Excel.

9. Construction of control charts for variables ($\bar{x}$, **R** and σ - charts) using R and MS – Excel.

10. Construction of control charts for attributes (p, np with fixed and varying sample size, C and u charts) using R and MS- Excel.

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DSE-1(B)/Paper- 5 (B): Analytical Statistics-I
[4 HPW :: 4 Credits :: 100 Marks (External : 80, Internal : 20)]

UNIT-I

Sample Surveys : Principal steps in sample surveys, census versus sample surveys, sampling and non- sampling errors, advantages and limitations of sampling.

Sampling Methods: Types of sampling : Subjective, Quota, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean and total, their variances and the estimates of variances in Simple Random Sampling With and Without Replacement, Stratified Random Sampling with Proportional and Neyman optimum allocation and Systematic Sampling when N= nk.

UNIT-II

Time Series: Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares and moving average methods. Growth curves and their fitting with reference to Modified exponential, Gompertz and Logistic curves. Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

UNIT-III

Statistical Quality Control : Importance of SQC in industry. Dimensions of quality, Statistical basis of Shewart control charts. Construction of control charts for variables (mean, range and standard deviation) and attributes (p, np, c and u- charts with fixed and varying sample sizes). Interpretation of control charts.

UNIT-IV

Analysis of Variance and Design of Experiments: Concept of Gauss-Markov linear model with examples, statement of Cochran's theorem, ANOVA , one-way, two-way classifications with one observation per cell, Statistical analysis, Importance and applications of design of experiments, Principles of experimentation, Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D) and Latin Square design (LSD) including one missing observation.

References:

1. S.C.Gupta and V.K.Kapoor: Fundamentals of Applied Statistics, Sultan Chand

2. B. L. Agarwal : Basic Statistics, New Age publications.

3. S. P. Gupta : Statistical Methods. Sultan Chand and Sons.

4. Parimal Mukhopadhyay : Applied Statistics, New Central Book agency.

5. Daroga Singh and Chowdhary : Theory and Analysis of Sample survey designs. Wiley Eastern.

6. M. R. Saluja : Indian Official Statistics. ISI publications.

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Practical - 5 (B): Analytical Statistics – I
[With 3 HPW, Credits 1 and 25 Marks]

Practical (using R-Software)

R- Software : Overview of R, R data types and objects, reading and writing data, sub setting R Objects, Essentials of the R Language, Running R, Packages in R, Variable names and assignment, Operators, Integers, Factors, Logical operations. Operations of Scalars, Vectors, Lists, Arrays, Matrices, Data Frames. Control structures, Functions.

1. Data Visualization using R - Frequency polygons and curves, Ogives, Histogram.

2. Data Visualization using R - Bar diagrams (simple, compound, percentage and multiple) and Pie diagram (single and multiple).

3. Computation of Descriptive Statistics using R (Measures of Central tendencies and Dispersion, Moments, Skewness and Kurtosis).

4. Computation of expected frequencies for Binomial, Poisson using R.

5. Computation of expected frequencies of Normal and Exponential distributions using R.

6. Computation of Karl Pearson's coefficient of correlation and rank correlation using R.

7. Computation of partial and multiple correlations using R.

8. Analysis of Variance for one way and two way classified data using R.

9. Analysis of Variance for CRD and RBD two way classified data using R.

10. Time series Analysis: Computation of Secular trend by least squares and moving averages methods using R.

11. Computation of Seasonal variations by Ratio to moving averages, Ratio to trend and Link Relatives methods using R.

12. Construction of control charts for variables ($\bar{x}$, R and σ - charts) using R.

13. Construction of control charts for attributes (p, np with fixed and varying sample size, C and u charts) using R.

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DSE-2(A)/Paper-6(A): Applied Statistics-II
[4 HPW :: 4 Credits :: 100 Marks (External : 80, Internal : 20)]

Unit-I

Analysis of Variance and Design of Experiments : Concept of Gauss-Markoff linear model with examples, statement of Cochran's theorem, ANOVA, one-way, two-way classifications with one observation per cell Expectation of various sums of squares, Statistical analysis, Importance and applications of design of experiments.

Unit-II

Principles of experimentation, Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies for above designs.

Unit-III

Vital statistics : Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate of natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

Unit-IV

Indian Official Statistics: Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in estimation of national income.

Index Numbers : Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyer's, Paasche's and Fisher's index numbers, criterion of a good index numbers, problems involved in the construction of index numbers. Fisher's index as an ideal index number. Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers.

References:

1. V.K. Kapoor and S.C. Gupta : Fundamentals of Applied Statistics. Sultan Chand

2. A. M. Goon, M. K. Gupta, B. Das Gupta : Fundamentals of Statistics,Vol - II
    World Press Private Ltd, Calcutta

3. A. M. Goon, M. K. Gupta, B. Das Gupta : An outline of Statistical Theory, Vol- II,
    World Press Private Ltd,Calcutta-17.

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Practical-6(A): Applied Statistics - II
[with 3 HPW, Credits 1 and Marks 25]

Practical (using R-Software and MS-Excel)

1. Generation Random Samples from the Uniform, Binomial, Poisson, Normal and Exponential distributions using R.

2. Fitting of straight line, parabola and power curves of the type $y = ax^b$, $y = ab^x$ and $y = a\,e^{bx}$ using R.

3. Large sample tests : Testing population means, proportions, variances based on single and two samples using R.

4. Parametric Tests : Testing means, variances based on single and two samples using R.

5. Tests based on χ^2 distribution using R.

6. Nonparametric Tests : one sample run test, Sign test and Wilcoxon signed rank test for one and two samples using R.

7. Nonparametric Tests : Median test, Wilcoxon-Mann Whitney U-test, Wald-wolfowitz's runs test using R.

8. Analysis of Variance for CRD and RBD data using R and MS - Excel.

9. Analysis of Variance for RBD without and with one missing observation using R and MS - Excel.

10. Analysis of Variance for LSD without and with one missing observation using R and MS - Excel.

11. Computation of Morality rates, Fertility rates and Reproduction rates using MS-Excel.

12. Construction of life tables using MS-Excel.

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KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2021-2022 onwards)
B.Sc. STATISTICS
III Year :: Semester-VI

DSE-2(B)/Paper-6 (B) : Analytical Statistics-II
[4 HPW:: 4 Credits :: 100 Marks (External : 80, Internal : 20)]

Unit-I

Multivariate distributions: Introduction, concept of Multivariate, Definitions and Statements of properties of Multinomial and Multivariate Normal Distributions.

Regression Analysis: Definition, procedure of Least square estimation, methods of analysis and interpretation, Simple Linear Regression and Multiple Linear Regression for 'n' variables : estimation of parameters, Lack of fit, Mean Square Error, R^2 and adjusted R^2 values, Testing Regression coefficients.

Logistic regression: Definition and model assumptions, estimation of parameters, statements of properties for simple and Multiple Logistic regression. Interpretation of the same.

Unit-II

Multivariate Data Analysis Techniques : Definitions, Statements of properties of Principal Component Analysis, Factor Analysis, Cluster analysis and Linear Discriminant Analysis (Bayesian and Fisher's approaches), Multi-dimensional Scaling, Applications and interpretation of above techniques to Image processing / pattern recognition.

(In first two Units emphasis will be on concepts and applications of techniques only.)

Unit-III

Vital statistics : Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate of natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

Unit-IV

Indian Official Statistics: Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in estimation of national income.

Index Numbers : Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyer's, Paasche's and Fisher's index numbers, criterion of a good index numbers, problems involved in the construction of index numbers. Fisher's index as an ideal index number. Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers.

References:

1. E-Book : https://onlinelibrary.wiley.com/doi/book/10.1002/9781118391686

2. V.K.Kapoor and S.C.Gupta : Fundamentals of Applied Statistics. Sultan Chand

3. Johnson and Wrichon : Multivariate Analysis.

4. Pratirupa Sidhanthamulu , Telugu Academy,

5. Prayoga Rachana and Visleshana, Telugu Academy.

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Practical-6 (B): Analytical Statistics - II
[with 3 HPW, Credits 1 and Marks 25]

Practical (using R-Software)

1. Generation Random Samples from the Uniform, Binomial, Poisson, Normal and Exponential distributions using R.

2. Fitting of straight line, parabola and power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ using R.

3. Large sample tests : Testing population means, proportions, variances based on single and two samples and tests based on χ^2 distribution using R.

4. Parametric Tests : Testing means, variances based on single and two samples using R.

5. Nonparametric Tests : one sample run test, Sign test and Wilcoxon sign rank test for one and two samples, Median test, Wilcoxon Mann Whitney - U test, Wald - Wolfowitz's runs test using R.

6. Principal Component Analysis using R.

7. Factor Analysis using R.

8. Cluster analysis and Linear Discriminant analysis using R.

9. Model fitting by Simple and Multiple Linear Regression methods using R.

10. Model fitting by simple Logistic regression using R.

11. Computation of Morality rates, Fertility rates and Reproduction rates using R.

12. Construction of life tables using R.

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Programming in C   Semester -I

Theory	4 Hours/Week	4 credit
Practical	3 Hours/Week	1 credit

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.

Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.

Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.

Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation–precedence and associativity, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,

Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.

Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays.

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.

Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

Unit – IV

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Array of Structures (Union), Structures verses Unions, Enumeration Types.

Files: Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

Text	Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)
References BOOKS	Ivor Horton, Beginning C Ashok Kamthane, Programming in C Herbert Schildt, The Complete Reference C Paul Deitel, Harvey Deitel, C How To Program Byron S. Gottfried, Theory and Problems of Programming with C Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

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KAKATIYA UNIVERSITY
WARANGAL (T.S.)

C Lab   Semester -I

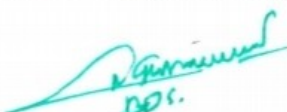| Practical	3 Hours/Week	1 credit

1   Write a program to find the largest two (three) numbers using if and conditional operator.

2   Write a program to print the reverse of a given number.

3   Write a program to print the prime number from 2 to n where n is given by user.

4   Write a program to find the roots of a quadratic equation using switch statement.

5   Write a program to print a triangle of stars as follows (take number of lines from user):

```
    *
   ***
  *****
 *******
*********
```

6   Write a program to find largest and smallest elements in a given list of numbers.

7   Write a program to find the product of two matrices..

8   Write a program to find the GCD of two numbers using iteration and recursion.

9   Write a program to illustrate use of storage classes.

10   Write a program to demonstrate the call by value and the call by reference concepts.

11   Write a program that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.

12   Write a program to illustrate use of data type enum.

13   Write a program to demonstrate use of string functions string.h header file.

14   Write a program that opens a file and counts the number of characters in a file.

15   Write a program to create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

16   Write a program that opens an existing text file and copies it to a new text file with all lowercase letters changed to capital letters and all other characters unchanged.

Note   Write the Pseudo Code and draw Flow Chart for the above programs.
Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows

10.

Programming in C++   Semester -II

Theory	4 Hours/Week	4 credits
Practical	3 Hours/Week	1 credit

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.
Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.
Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Unit – II

Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Member-wise Assignment, Copy Constructors, Operator Overloading, Object Conversion, Aggregation.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Redefining Base Class Functions, Class Hierarchies, Polymorphism and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.
C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Extracting Data from the Exception Class, Re-throwing an Exception, Handling the bad_alloc Exception.
Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance, Introduction to the STL.

Text	Tony Gaddis, Starting out with C++: from control structures through objects (7e)
References	B. Lippman, C++ Primer
	Bruce Eckel, Thinking in C++
	K.R. Venugopal, Mastering C++
	Herbert Schildt, C++: The Complete Reference
	Bjarne Stroustrup, The C++ Programming Language
	Sourav Sahay, Object Oriented Programming with C++

C++ Lab   Semester -II

| Practical | 3 Hours/Week | 1 credit |

1 Write a program to.

   a. Print the sum of digits of a given number.

   b. Check whether the given number is Armstrong or not

   c. Print the prime number from 2 to n where n is natural number given.

2 Write a program to find largest and smallest elements in a given list of numbers and sort the given list.

3 Write a program to read the student name, roll no, marks and display the same using class and object.

4 Write a program to implement the dynamic memory allocation and de-allocation using new and delete operators using class and object.

   Write a program to find area of a rectangle, circle, and square using constructors.

5

6 Write a program to implement copy constructor.

7 Write a program using friend functions and friend class.

8 Write a program to implement constructors
   § Default Constructor, Parameterized Constructor, Copy Constructor
   § Define the constructor inside/outside of the class
   § Implement all three constructors within a single class as well as use multiple classes(individual classes)
   Write a program to implement the following concepts using class and object
   § Function overloading
   § Operator overloading (unary/binary(+ and -))

   Write a program to demonstrate single inheritance, multilevel inheritance and multiple *inheritances*.

   Write a program to implement the overloaded constructors in inheritance.

   Write a program to implement the polymorphism and the following concepts using class and object.
   § Virtual functions
   § Pure virtual functions
   Write a program to implement the virtual concepts for following concepts
   § Constructor (not applied)
   § Destructor (applied)

   Write a program to demonstrate static polymorphism using method overloading.

   Write a program to demonstrate dynamic polymorphism using method overriding and dynamic method dispatch.
   Write a program to implement the template (generic) concepts
   § Without template class and object
   § With template class and object

   Write the Pseudo Code and draw Flow Chart for the above programs.

   Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows.

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KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS 2020–2021onwords)
B.Sc. Computer Science II Year
SEMESTER – III

DATA STRUCTURES USING C++

Theory: 4 Hours/Week;   Credits: 4   Marks: 100 (Internal: 20; External: 80)
Practical: 3 Hours/Week   Credits: 1   Marks: 25

Unit - I

Basic data Structure: Introduction to Data Structures, Types of Data Structures, and Introduction to Algorithms,   Pseudo code,   and   Relationship   among   data,   data structures, and algorithms, Implementation of data structures, Analysis of Algorithms.

Stacks: Concept of Stacks and Queues, Stacks, Stack Abstract Data Type, Representation of Stacks Using Sequential Organization (Arrays), Multiple Stacks, Applications of Stack, Expression Evaluation and Conversion, Polish notation and expression conversion, Processing of Function Calls, Reversing a String with a Stack, Recursion.

Unit - II

Recursion: Introduction, Recurrence, Use of Stack in Recursion, Variants of Recursion, Recursive Functions, Iteration versus Recursion.

Queues: Concept of Queues, Queue as Abstract Data Type, Realization of Queues Using Arrays, Circular Queue, Multi-queues, Dequeue, Priority Queue, Applications of Queues,

Linked Lists: Introduction, Linked List, Linked List Abstract Data Type, Linked List Variants, Doubly Linked List, Circular Linked List, Representation of Sparse Matrix Using Linked List, Linked Stack, Linked Queue.

Unit - III

Trees: Introduction, Types of Trees, Binary Tree, Binary Tree Abstract Data Type, Realization of a Binary Tree, Insertion of a Node in Binary Tree, Binary Tree Traversal, Other Tree Operations, Binary Search Tree, Threaded Binary Tree, Applications of Binary Trees.

Searching and Sorting: Search Techniques-Linear Search, Binary Search, Sorting Techniques- Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Quick Sort, Comparison of All Sorting Methods, Search Trees: Symbol Table, Optimal Binary Search Tree, AVL Tree (Height-balanced Tree).

Unit - IV

Graphs: Introduction, Representation of Graphs, Graph Traversal – Depth First Search, Breadth First Search, Spanning Tree, Prim's Algorithm, Kruskal's Algorithm.

Hashing: Introduction, Key Terms and Issues, Hash Functions, Collision Resolution Strategies,   Hash Table Overflow, Extendible Hashing

Heaps: Basic Concepts, Implementation of Heap, Heap as Abstract Data Type, Heap Sort, Heap Applications.

Text books:

1. Varsha H. Patil "Data structures using C++" Oxford University press, 2012
2. M.T. Goodrich, R. Tamassia and D. Mount, Data Structures and Algorithms in C++, John Wiley and Sons, Inc., 2011.

References:

1. Adam Drozdek "Data structures and algorithm in C++" Second edition, 2001
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction to Algorithms,2nd Ed., Prentice-Hall of India, 2006.
3. Robert L. Kruse and A.J. Ryba, Data Structures and Program Design in C++, PrenticeHall, Inc., NJ, 1998.
4. B. Stroupstrup, The C++ Programming Language, Addison Wesley, 2004
5. D.E. Knuth, Fundamental Algorithms (Vol. I), Addison Wesley, 1997

DATA STRUCTURES USING C++ LAB
Practical   3 Hours/Week   1 Credit   Marks: 25

Note:

- Programs of all the Concepts from Text Book including exercises must be practice and execute.
- In the external lab examination student has to execute two programs with compilation and deployment steps are necessary.
- External Vice-Voce is compulsory.

1. Write C++ programs to implement the following using an array
   a) Stack ADT   b) Queue ADT
2. Write a C++ program to implement Circular queue using array.
3. Write C++ programs to implement the following using a single linked list.
   a) Stack ADT   b) Queue ADT
4. Write a C++ program to implement Circular queue using Single linked list.
5. Write a C++ program to implement the double ended queue ADT using double linked list.
6. Write a C++ program to solve tower of Hanoi problem recursively
7. Write C++ program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from binary search tree.
   c) Search for a key in a binary search tree.
8. Write C++ programs for the implementation tree traversal technique BFS.
9. Write a C++ program that uses recursive functions to traverse a binary search tree.
   a) Pre-order   b) In-order   c) Post-order
10. Write a C++ program to find height of a tree.
11 Write a C++ program to find MIN and MAX element of a BST.
12 Write a C++ program to find Inorder Successor of a given node.
13. Write C++ programs to perform the following operations on B-Trees and AVL Trees.
    a) Insertion   b) Deletion
14 Write C++ programs for sorting a given list of elements in ascending order using the following sorting methods.
    a) Quick sort   b) Merge sort
15. Write a C++ program to find optimal ordering of matrix multiplication.
16. Write a C++ program that uses dynamic programming algorithm to solve the optimal binary search tree problem
17. Write a C++ program to implement Hash Table
18. Write C++ programs to perform the following on Heap
    a) Build Heap   b) Insertion   c) Deletion
19. Write C++ programs to perform following operations on Skip List
    a) Insertion   b) Deletion
20. Write a C++ Program to Create a Graph using Adjacency Matrix Representation.
21. Write a C++ program to implement graph traversal techniques
    a) BFS   b) DFS
22. Write a C++ program to Heap sort using tree structure.

Dr. B.Rama Chairperson Board of Studies, Department of Computer Science, KU

KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS 2020 – 2021 onwards)
B.Sc. Computer Science II Year
SEMESTER – IV

DATA BASE MANAGEMENT SYSTEMS

Theory:	4 Hours/Week;	Credits: 4	Marks: 100 (Internal: 20; External: 80)
Practical:	3 Hours/Week	Credits: 1	Marks: 25

Unit - I

Introduction: Database-System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Database Users and Administrators.
Introduction to the Relational Model: Structure of Relational Databases, Database
Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.

Unit - II

Database Design and the E-R Model: Overview of the Design Process, The Entity- Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features, Alternative Notations for Modeling Data, Other Aspects of Database Design.
Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional- Dependency Theory, Decomposition Using Multivalued Dependencies, Normal Forms-2 NF, 3 NF, BCNF, The Database Design Methodology for Relational Databases.

Unit - III

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries, Modification of the Database.
Intermediate SQL: Join Expressions, Views, Transactions, Integrity Constraints, SQL Data Types and Schemas, Authorization.
Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries.

Unit - IV

Transaction Management: Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery–The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model. Security: Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

Text book:

1. Silberschatz, H. Korth and S. Sudarshan, Database System Concepts, 6th Ed., Tata McGraw Hill, 2011
2. Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

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DATA BASE MANAGEMENT SYSTEMS - LAB
Practical   3 Hours/Week   1 Credit   Marks: 25

Note:
- Programs of all the Concepts from Text Book including exercises must be practice and execute.
- In the external lab examination student has to execute two programs with compilation and deployment steps are necessary.
- External Vice-Voce is compulsory.

1. Create a database having two tables with the specified fields, to computerize a library system of a University College.
   LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price),
   IssuedBooks (Accession number, Borrower)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Delete the record of book titled "Database System Concepts".
   c) Change the Department of the book titled "Discrete Maths" to "CS".
   d) List all books that belong to "CS" department.
   e) List all books that belong to "CS" department and are written by author "Navathe".
   f) List all computer (Department="CS") that have been issued.
   g) List all books which have a price less than 500 or purchased between "01/01/1999" and "01/01/2004".

2. Create a database having three tables to store the details of students of Computer Department in your college.
   Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)
   Paper Details (Paper code, Name of the Paper)
   Student's Academic and Attendance details (College roll number, Paper Code, Attendance, Marks in home examination).

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper2.
   c) List all students who live in "Warangal" and have marks greater than 60 in paper1.
   d) Find the total attendance and total marks obtained by each student.
   e) List the name of student who has got the highest marks in paper2.

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3. Create the following tables and answer the queries given below:
    Customer (CustID, email, Name, Phone, ReferrerID)
    Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)
    BicycleModel(ModelNo, Manufacturer, Style) Service
    (StartDate, BicycleID, EndDate)

    a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
    b) List all the customers who have the bicycles manufactured by manufacturer "Honda".
    c) List the bicycles purchased by the customers who have been referred by Customer "C1".
    d) List the manufacturer of red colored bicycles.
    e) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.
    Employee (Person_Name, Street, City)
    Works (Person_Name, Company_Name, Salary)
    Company (Company_Name, City)
    Manages (Person_Name, Manager_Name)

    a) Identify primary and foreign keys.
    b) Alter table employee, add a column "email" of type varchar(20).
    c) Find the name of all managers who work for both Samba Bank and NCB Bank.
    d) Find the names, street address and cities of residence and salary of all employees who work for "Samba Bank" and earn more than $10,000.
    e) Find the names of all employees who live in the same city as the company for which they work.
    f) Find the highest salary, lowest salary and average salary paid by each company.
    g) Find the sum of salary and number of employees in each company.
    h) Find the name of the company that pays highest salary.

5. Create the following tables, enter at least 5 records in each table and answer the queries given below.
    Suppliers (SNo, Sname, Status, SCity)
    Parts (PNo, Pname, Colour, Weight, City)
    Project (JNo, Jname,Jcity)
    Shipment (Sno, Pno, Jno, Qunatity)

    a) Identify primary and foreign keys.
    b) Get supplier numbers for suppliers in Paris with status>20.
    c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
    d) Get suppliers names for suppliers who do not supply part P2.
    e) For each shipment get full shipment details, including total shipment weights.
    f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
    g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by   suppliers S2, or both.
    h) Get the names of cities that store more than five red parts.
    i) Get full details of parts supplied by a supplier in Hyderabad.

j) Get part numbers for part supplied by a supplier in Warangal to a project in Chennai.
k) Get the total number of project supplied by a supplier (say, S1).
l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

6. Write a PL/SQL Program to demonstrate Procedure.
7. Write a PL/SQL Program to demonstrate Function.
8. Write a PL/SQL program to Handle Exceptions.
9. Write a PL/SQL Program to perform a set of DML Operations.
10. Create a View using PL/SQL program.
11. Write a PL/SQL Program on Statement Level Trigger.
12. Write a PL/SQL Program on Row Level Trigger.

KAKATIYA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – V
Programming in Java

| Theory | 4 Hours/Week | 4 Credit | Internal marks = 20 |
| Practical | 3 Hours/Week | 1 Credit | External Marks = 80 |

Unit - I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Structure of Java Program, Type Casting, Conditional Statements, Loops, Classes, Objects, Class Declaration, Creating Objects.

Unit - II

Method Declaration and Invocation, Method Overloading, Constructors – Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects. Class Variables &Method-static Keyword, this Keyword, One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class.

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keyword, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Packages: Creating and Using Packages, Access Protection, Wrapper Classes, String Class, StringBuffer Class.

Unit - III

Exception: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

Multithreading: Introduction, Main Thread and Creation of New Threads –By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority and Synchronization.

Input/Output: Introduction, java.io Package, File Streams, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

Unit - IV

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output (Graphics Class).

Event Handling: Introduction, Types of Events, Example.

AWT: Introduction, Components, Containers, Button, Label, Checkbox, Radio Buttons, Container Class, Layouts.

Swings: Introduction, Differences between Swing and AWT, JFrame, JApplet, JPanel, Components in Swings, Layout Managers, JTable.

Text Book:

1. Sachin Malhotra, Saurabh Choudhary, Programming in Java (2e)

References:

1. Bruce Eckel, Thinking in Java (4e)
2. Herbert Schildt, Java: The Complete Reference (9e)
3. Y. Daniel Liang, Introduction to Java Programming (10e)
4. Paul Deitel, Harvey Deitel, Java: How To Program (10e)
5. Cay S. Horsttnann, Core Java Volume I –Fundamentals (10e)

Dr. B. RAMA
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Department of Computer Science, KU   With Effect from the Academic Year 2019-2020

KAKATIYA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – V
Programming in Java Lab

Practical   3 Hours/Week   1 Credit   Marks: 25

Note:

- Programs of all the Concepts from Text Book including exercises must be practice and execute.
- In the external lab examination student has to execute two programs with compilation and deployment steps are necessary.
- External Vice-Voce is compulsory.

1. Write a program to find the largest of n natural numbers.
2. Write a program to find whether a given number is prime or not.
3. Write a menu driven program for following:
   a. Display a Fibonacci series
   b. Compute Factorial of a number
4. Write a program to check whether a given number is odd or even.
5. Write a program to check whether a given string is palindrome or not.
6. Write a program to print the sum and product of digits of an Integer and reverse the Integer.
7. Write a program to create an array of 10 integers. Accept values from the user in that Array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
8. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
9. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
10. Write java program for the following matrix operations:
    a. Addition of two matrices
    b. Transpose of a matrix
11. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.
12. Write a Java program for the implementation of multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
13. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
14. Write a java program to draw a line between two coordinates in a window.
15. Write a java program to display the following graphics in an applet window.
    a. Rectangles   b. Circles
    c. Ellipses   d. Arcs   e. Polygons
16. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage () prints the information about the error occurring causes.
17. Write a program for the following string operations:
    a. Compare two strings   b. concatenate two strings   c. Compute length of a string

18. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

Department of Computer Science, KU

With Effect from the Academic Year 2019-2020

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

Unit – I

Introduction To XHTML– Introduction, first HTML, Headings, Linking, Images, special characters and horizontal rules, Lists, Tables, Frames, Forms, internal linking, meta Elements. CASCADING STYLE SHEETS – Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking external sheets, position Elements, box model and text flow, media types, building a CSS drop-down menu, user style sheets, CSS3.

Unit – II

Introduction To Java Scripting- introduction, simple program, prompt dialog and alert boxes, memory concepts, operators, decision making, control structures, if… else statement, while, counter-controlled repetitions, switch statement, do… while statement, *break* and *continue* statements. Functions – program modules in JavaScript, programmer–defined functions, functions definition, scope rules, global functions, Recursion.

Unit – III

Arrays- introduction, declaring and allocating arrays, references and reference parameters, passing arrays to functions. Multidimensional arrays, **EVENTS** – registering event handling, event onload, onmouseover, onmouseout, onfocus, onblur, onsubmit, onreset, event bubbling, more events. **JAVA SCRIPT OBJECTS** – introduction to object technology, Math Object, String Object, Date Object, Boolean and Number Object, document and window Objects, using cookies.

Unit – IV

XML - Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

Ajax-Enabled Rich Internet Applications: introduction, history of Ajax, traditional web applications Vs Ajax Applications, RIAs with Ajax, Ajax example using XMLHttpRequest object, XML and DOM, creating full scale Ajax-enabled application, Dojo Toolkit.

Text Book:
1. Internet & World Wide Web: HOW TO PROGRAM- H. M. Deitel, P.J. Deitel, -Fourth Edition- Pearson edition.

Department of Computer Science, KU

With Effect from the Academic Year 2019-2020

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20

KAKATIYA UNIVERSITY
FACULTY OF SCIENCE
B.Sc. (Computer Science)
SEMESTER – VI
Web Technologies Lab

Practical   3 Hours/Week   1 Credit   Marks: 25

1. Write a HTML program using basic text formatting tags, <p>, <br>, <pre>.
2. Write a HTML program by using text formatting tags.
3. Write a HTML program using presentational element tags <b>, <i>, <strike>, <sup>, <sub>, <big>, <small>, <hr>
4. Write a HTML program using phrase element tags <blockquote>, <cite>, <abbr>, <acronym>, <kbd>, <address>
5. Write a HTML program using different list types.
6. Create a HTML page that displays ingredients and instructions to prepare a recipe.
7. Write a HTML program using grouping elements <div> and <span>.
8. Write a HTML Menu page for Example cafe site.
9. Write a HTML program using images, audios, videos.
10. Write a HTML program to create your time table.
11. Write a HTML program to create a form using text inputs, password inputs, multiple line   text input, buttons, check boxes, radio buttons, select boxes, file select boxes.
12. Write a HTML program to create frames and links between frames.
13. Write a HTML program to create different types of style sheets.
14. Write a HTML program to create CSS on links, lists, tables and generated content.
15. Write a HTML program to create your college web site using multi column layouts.
16. Write a HTML program to create your college web site using for mobile device.
17. Write a HTML program to create login form and verify username and password.
18. Write a JavaScript program to calculate area of rectangle using function.
19. Write a JavaScript program to wish good morning, good afternoon, good evening   depending on the current time.
20. Write a JavaScript program using switch case?
21. Write a JavaScript program to print multiplication table of given number using loop.
22. Write a JavaScript programs using any 5 events.
23. Write a JavaScript program using JavaScript built in objects.
24. Write a JavaScript program to create registration Form with Validations.
25. Write a XML Program to represent Student Data using DTD.
26. Write a XML Program to represent Data using XML Schema Definition.

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