	SEMESTER-I	L	P	T	C
R23	Course-1: Essentials and Applications of Mathematical, Physical and Chemical Sciences	5	--	--	4
	TOTAL CONTACT HOURS–70				

COURSE OBJECTIVES:

- The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences.
- The course aims to develop students' critical thinking, problem-solving
- Analytical skills in these areas,
- Enabling them to apply scientific principles to real-world situations

SYLLABUS

UNIT I: ESSENTIALS OF MATHEMATICS: 16hr

(a) Complex Numbers: Introduction of the new symbol i – General Form of a complex number – Modulus-Amplitude form and conversions Trigonometric Ratios: Trigonometric Ratios and their relations

(b) Problems on calculation of angles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS: 15hr

(a) Definition and Scope of Physics- definitions of Measurements and Units - Motion of objects: Newton's three Laws and applications, Principles of relativistic mechanics on based on two postulates - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves-

(b) Electric and Magnetic fields and their interactions- Behavior of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Helios centric and Big bang Theories, understanding of universe

UNIT III: ESSENTIALS OF CHEMISTRY: 12hr

(a) Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table-

(b) Electronic Configuration, chemical changes, classification of matter, Bimolecular- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY   14hr

(a) (i) **Applications of Mathematics in Physics & Chemistry**: Calculus, Differential Equations & Complex Analysis

(ii) **Application of Chemistry in Industry and Technology**: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

(b) **Application of Physics in Industry and Technology**: Aspects of Electronics and Semiconductor Industry, Components of Robotics, Benefits of Automation, Components and segments Automotive, segments of Aerospace Industry, Quality Control in Instrumentation, Environmental Monitoring and Sustainable Technologies

UNIT V: ESSENTIALS OF COMPUTER SCIENCE: 13hr

(a) Milestones of computer evolution – Internet- history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

(b) WWW-web Applications, Web Terminologies, Web Browsers, URL- Components of URL, searching WWW- search Engines and examples

Reference Books:

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.

2. Elementary Trigonometry by H.S.Hall and S.R.Knight

3.Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.

4. Basic Statistics by B.L.Agarwal, New age international Publishers

5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman

6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker

7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W.Jewett Jr.

8. Physics for Technology and Engineering" by John Bird

9. Chemistry in daily life by Kirpal Singh

10. Chemistry of bio molecules by S. P. Bhutan

11. Fundamentals of Computers by V. Raja Raman

12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olso

Learning Outcomes:

At the end of the course, the learners should be able to:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.

2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations

3. To explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to connect their knowledge of chemistry to daily life.

4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures

	SEMESTER-I	L	P	T	C
R23	**Course-2: Advances in Mathematical, Physical and Chemical Sciences**	5	0	--	4
	TOTAL CONTACT HOURS–70				

COURSE OBJECTIVES:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences.

The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

SYLLABUS

UNIT I   16hrs

ADVANCES IN BASICS MATHEMATICS
Straight Lines: Different forms- Reduction of general equation into various forms -–Point of intersection of two straight lines
Limits and Differentiation: Standard limits -– Derivative of a function- –Problems on product rule and quotient rule
Integration: Integration as a reverse process of differentiation -– Basic methods of integration

Matrices: Types of matrices –- Scalar multiple of a matrix -– Multiplication of matrices -– Transpose of a matrix and determinants

UNIT II   15hrs

ADVANCES IN PHYSICS:
Renewable energy: Generation, energy storage, and energy-efficient materials and devices.
Recent advances in the field of nanotechnology: Idea of Nano Science and Nano Technology,
Nano metric systems, Quantum dots, Quantum Communication; **Nanotechnology in bio-physics;**
Recent advances in medical physics- **Radiation therapy advantages, Radiation protection and safety.**

UNIT III   12hrs

ADVANCES IN CHEMISTRY:
Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV   14hrs

ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY
Mathematical Modelling applications in physics and chemistry Application of Renewable energy:
Grid Integration and Smart Grids,
Application of nanotechnology: Nano medicine,
Application of biophysics: Biophysical Imaging, Biomechanics, Neuro-physics,

Application of medical physics: Radiation Therapy, Nuclear medicine
Solid waste management, Environmental remediation- Green Technology, Water treatment.

UNIT V: ADVANCED APPLICATIONS OF COMPUTER SCIENCE   **13hrs**
Number System-Binary, Octal, decimal, and Hexadecimal and their conversions, Signals-Analog, Digital,
Modem, Multiplexing& De-Multiplexing, Transmission media- characteristics and types, Networking devices- Repeater, hub, bridge, switch, router, gateway (Qualitative).

REFERENCE BOOKS:
RB1. Coordinate Geometry by S.L.Lony, Arihant Publications
RB2. Calculus by Thomas and Finny, Pearson Publications
RB3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
RB4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
RB5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
RB6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
RB7. "Biophysics: An Introduction" by Rodney Cotterill
RB8. "Medical Physics: Imaging" by James G. Webster
RB9. Nano materials and applications by M.N.Borah

RB10. Environmental Chemistry by Anil.K.D.E.
RB11. Digital Logic Design by Morris Mano
RB12. Data Communication & Networking by Bahrouz Forouzan.

LEARNING OUTCOMES:
On successful completion of this course, the student will be able to:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nano materials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
4. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health.
5. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
6. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless
     (e.g., radio waves, microwave, satellite).

R -23	SEMESTER – I	T	P	C
	A COURSE IN COMMUNICATION AND SOFT SKILLS **English Language Course-I** (w.e.f 2023 -24 Admitted Batch)	4	0	4

COURSE OBJECTIVES:

The objectives of this course is to make the students:

- Grasp the importance of listening and its types.
- Acquire the knowledge on phonetics with reference to sounds, accent, intonation and rhythm.
- Learn the grammar topics i.e., concord, tenses, articles, prepositions and question tags.
- Enhance speaking skills with the help of Obama`s speech `Yes, We Can` and Kalam`s `A Leader Should Know How to Manage Failure`.
- To get an overview about soft skills i.e., attitude, E.I, T.E. and Interpersonal Skills.

SYLLABUS

UNIT - I:Listening Skills

   a. Importance of Listening.

   b. Types of Listening.

   c. Barriers to Listening.

   d. Effective Listening.

UNIT - II: Speaking Skills

   a. Sounds of English: Vowels and Consonants.

   b. Syllable

   c. Word Stress

   d. Intonation

UNIT - III: Grammar

   a. Concord.

   b. Articles

c. Prepositions

d. Tenses

e. Question Tags

UNIT - IV: <u>Writing</u>

a. Greetings & Introduction

b. Asking &Giving Information

c. Yes, We Can – Barack Obama

d. Agreeing & Disagreeing

e. A Leader Should Know How to Manage Failure – Dr.A. P. J. Abdul Kalam

UNIT - V:<u>Soft Skills</u>

a. SWOC.

b. Attitude.

c. Emotional Intelligence.

d. Telephone Etiquette.

e. Inter personal Skills.

<u>CO-CURRICULAR ACTIVITIES</u>:

- Class Room Seminars.
- Group Discussions.
- Role Play.
- Assignments.

<u>TEXT BOOKS</u>:

- English Praxis Course-I by Maruthi Publications.
- English Praxis Course-I by A Course on Communication and Soft skills   ---Vivanta Press.

<u>REFERENCE BOOKS</u>:

- A text book of English Phonetics for Indian Students by T.Balasubramanian.
- Essentials of English Grammer by Raymond Murphy.
- Soft Skills Training – A work book to develop Skills for employment by Frederick H. Wentz

1. Duolingo (https://www.duolingo.com/) - This is a language-learning platform that offers a fun and interactive way to learn English through games, exercises, and quizzes.

2. BBC Learning English (https://www.bbc.co.uk/learningenglish/) - The BBC offers a comprehensive range of resources for learners of English, including grammar, vocabulary, and pronunciation.

3. English Central (https://www.englishcentral.com/) - This website provides a platform for practicing your English listening and speaking skills through video lessons and interactive activities.

4. Busuu (https://www.busuu.com/) - Busuu is a language-learning platform that offers lessons in English grammar, vocabulary, and conversation practice.

Activities :

- Make the students to news excerpts.
- Watch interviews and speeches on You Tube.
- Role plays on formal and informal covesations.

LEARNING OUT COMES:

By the end of the course the learner will be able to:

- Understand the importance listening and practice effective listening.

- Use grammar effectively for accuracy in writing and speaking.

- Demonstrate the use of good vocabulary.

- Acquireability to use Soft Skills in professional and daily life.

- Confidently use the tools of communication skills.

COURSE INFORMATION SHEET

Program   : General Telugu
Year and semester   : I Semester
Course   : Saahiti Sourabham
Course Name   : TELUGU
Course Coordinator   :
Total Number of   hours : 60
External Marks   : 60

Lecture	Tutorial	Practical	No. Of Hrs per week	Credits
4	0	0	4	4

Course Objectives (అభ్యాసన లక్ష్యాలు):

1. Develop proficiency in reading, writing, and speaking skills
2. Introduce students to classical Telugu literature, including epics, poetry, drama, and philosophical texts.
3. Enhance knowledge of Telugu grammar (Vyakaranam).
4. Provide insights into Indian culture, philosophy, and heritage as reflected in Telugu texts.
5. Encourage the use of Telugu in modern contexts, including employability in education, research, and technology.

Course Outcomes (అభ్యాసన ఫలితాలు);

1. Demonstrate proficiency in Telugu through effective communication, both oral and written.
2. Analyze and interpret classical texts and apply their teachings to contemporary life.
3. Exhibit a clear understanding of Telugu grammar and its application in constructing verses and prose.
4. Develop skills for translation and interpretation of Telugu texts into modern languages.
5. Identify career opportunities in areas like teaching, translation, research, and cultural   tourism.

I-BA, BSC, BCOM డిగ్రీ జనరల్ తెలుగు సెమిస్టర్ -I

పాఠ్యప్రణాళిక - 2021-2022

మహారాజా కళాశాల (స్వయంప్రతిపత్తి). విజయనగరం

యూనిట్ – I	బోధన సమయం 7 గంటలు
రాజనీతి – నన్నయ	

యూనిట్ – II	బోధన సమయం 7 గంటలు
దక్షయజ్ఞం - నన్నెచోడుడు	

యూనిట్ – III	బోధన సమయం 7 గంటలు
ధౌమ్య ధర్మోపదేశము - తిక్కన	

యూనిట్ – IV	బోధన సమయం 6 గంటలు
పలనాటి బెబ్బులి - శ్రీనాథుడు	

యూనిట్ – V	బోధన సమయం 8 గంటలు
సీతారావణ సంవాదం - మొల్ల	

వ్యాకరణం	బోధన సమయం 3 గంటలు
1. సంధులు : ఉత్వ, త్రిక, ద్రుతప్రకృతిక, సుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జస్త్వ, అనునాసిక సంధులు.	

వ్యాకరణం	బోధన సమయం
	3 గంటలు

2. సమాసాలు: అవ్యయీభావ, తత్పురుష, కర్మ ధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.

అలంకారాలు	బోధన సమయం
	4 గంటలు

3. i) అర్థాలంకారాలు: ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అతిశయోక్తి అలంకారాలు.

   ii) శబ్దాలంకారాలు: అనుప్రాస (వృత్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యానుప్రాస).

ఛందస్సు	బోధన సమయం
	4 గంటలు

4. i) వృత్తాలు : ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

   ii) జాతులు : కందం, ద్విపద;

   iii) ఉపజాతులు : ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

యూనిట్ – VI - జర్నలిజం	బోధన సమయం
	6 గంటలు

   i) పాత్రికేయ విద్య

   ii) పత్రికా - భేదాలు

   iii) విలేఖరి - విలేఖనము

   iv) ఉపసంపాదకుడు

   v) సంపాదకుడు

పునశ్చరణ	బోధన సమయం
	5 గంటలు

అంశాలు	బోధన సమయం
యూనిట్ – I	7 గంటలు
యూనిట్ – II	7 గంటలు
యూనిట్ – III	7 గంటలు
యూనిట్ – IV	6 గంటలు
యూనిట్ – V	8 గంటలు
వ్యాకరణం	
i) సంధులు	3 గంటలు
ii) సమాసాలు	3 గంటలు
iii) అలంకారాలు	4 గంటలు
a) అర్థాలంకారాలు	
b) శబ్దాలంకారాలు	
iv) ఛందస్సు	4 గంటలు
a) వృత్తాలు	
b) జాతులు	
c) ఉపజాతులు	
యూనిట్ – VI (జర్నలిజం)	6 గంటలు
i) పాత్రికేయ విద్య	
ii) పత్రికా - భేదాలు	
iii) విలేఖరి - విలేఖనము	
iv) ఉపసంపాదకుడు	
v) సంపాదకుడు	
పునశ్చరణ	5 గంటలు
మొత్తం	**60 గంటలు**

పాఠ్య ప్రణాళిక

యూనిట్-I

రాజనీతి   -   నన్నయ

                      మహాభారతం-సభాపర్వం-ప్రథమాశ్వాసం-(26-57 పద్యాలు)

యూనిట్-II

దక్షయజ్ఞం   -   నన్నెచోడుడు

                      కుమారసంభవం-ద్వితీయాశ్వాసం- (49-86 పద్యాలు)

యూనిట్-III

ధౌమ్య ధర్మోపదేశము   -   తిక్కన

                      మహాభారతం-విరాటపర్వం -ప్రథమాశ్వాసం-(116–146) పద్యాలు

యూనిట్-IV

పలనాటి టెబ్బులి   -   శ్రీనాథుడు (పలనాటి వీరచరిత్ర- ద్విపద కావ్యం పుట 108-112 'బాలచంద్రుడు

                      భీమంటగు సంగ్రామం టొనర్చుట.. (108).. పెఱిగింది కుంది' (112) సం.

                      అక్కిరాజు ఉమాకాంతం ముద్రణ.వి.కె. స్వామి, బెజవాడ 1911.

యూనిట్-V

సీతారావణ సంవాదం   -   మొల్ల

                      రామాయణము-సుందరకాండము- (40-87 పద్యాలు)

- వ్యాకరణం

    1. సంధులు: ఉత్వ, త్రిక, ద్రుతప్రకృతిక, నుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జత్వ, అనునాసిక సంధులు.

    2. సమాసాలు: అవ్యయీభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహుప్రీహి.

    3. అలంకారాలు:

        a) అర్థాలంకారాలు : ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.

        b) శబ్దాలంకారాలు : అనుప్రాస (వృత్యనుప్రాస, ఛేకామప్రాస లాటానుప్రాస, అంత్యానుప్రాస)

    4. ఛందస్సు

        a) వృత్తాలు: ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

        b) జాతులు : కందం, ద్విపద; ఉపజాతులు: ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు.

యూనిట్-VI

     i)   పాత్రికేయ విద్య   ii)   పత్రికా – భేదాలు

    iii)   విలేఖరి – విలేఖనము   iv)   సంపాదకుడు

     v)   ఉపసంపాదకుడు

ఆధార గ్రంథాలు :

1. శ్రీమదాంధ్ర మహాభారతము : సభాపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ

2. శ్రీమదాంధ్ర మహాభారతము : విరాటపర్వము- తిరుమల తిరుపతి దేవస్థానం ప్రచురణ

3. కుమార సంభవం - నన్నెచోడుడు

4. పలనాటి వీరచరిత్ర - శ్రీనాథుడు

5. రామాయణము – మొల్ల

* సూచించబడిన సహపాఠ్య కార్యక్రమాలు :

1. నన్నయ్య, తిక్కన, ఎట్టిన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంశేతర పద్యాలను ఇచ్చి, విద్యార్థులచేత సమీక్షలు రాయించడం; ఆయా పద్యాల్లోని యతిప్రాసాది ఛందోవిశేషాలను గుర్తింపజేయడం.

2. విద్యార్థులచేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం (సెమినార్/అసైన్మెంట్)

3. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గూర్చిన బృంద చర్చ, ప్రాచీన సాహిత్యాన్ని నేటి సామాజిక దృష్టితో పునర్మూల్యాంకనం చేయించడం.

4. చారిత్రిక, సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.

5. వ్యక్తిగత/బృంద ప్రాజెక్టులు చేయించడం. ప్రశ్నా పత్ర నిర్మాతలకు సూచనలు ప్రతిపదార్థ పద్యాలు, కంరస్థ పద్యాలు "రాజనీతి, దక్షయజ్ఞం, ధౌమ్య ధర్మోపదేశం, సీతారావణ సంవాదం" అనే నాలుగు పాఠ్యాంశాల నుండి మాత్రమే ఇవ్వాలి.

	SEMESTER-I	L	P	T	C
R23	**Course 1: POETRY, PROSE & GRAMMER -I**	4	0	--	4
	SANSKRIT				
	TOTAL CONTACT HOURS–60				

Course Objectives

1. Develop proficiency in reading, writing, and speaking skills

2. Introduce students to classical Sanskrit literature, including epics, poetry, drama, and philosophical texts.

3. Enhance knowledge of Sanskrit grammar (Vyakarana).

4. Provide insights into Indian culture, philosophy, and heritage as reflected in Sanskrit texts.

5. Encourage the use of Sanskrit in modern contexts, including employability in education, research, and technology.

Course Outcomes:

1. Demonstrate proficiency in Sanskrit through effective communication, both oral and written.

2. Analyze and interpret classical texts and apply their teachings to contemporary life.

3. Exhibit a clear understanding of Sanskrit grammar and its application in constructing verses and prose.

4. Develop skills for translation and interpretation of Sanskrit texts into modern languages.

5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

Learning Outcomes:

1. प्राचीन संस्कृतसाहित्य ज्ञेयॐ प्रॉरंभॐ ज्ञानम् भवति ।
2. आधुनिक संस्कृतसाहित्य ज्ञेयॐ प्रॉरंभॐ ज्ञानम् भवति ।
3. मौलिक व्याकरण प्रॉरचयः भवति ।

II Syllabus: (Teaching Hours: 60)

Unit - 1: प्राचीन पर्साॅ ह× यम (12h)
1. धनुर्भॉगः - श्रीमद्रामायणे बालकाॅंडे 67 सगः [
2. शरणागतरक्षणम - श्रीमहाभारते अनुशासनपर्वणि 32 अध्यायः

Unit - 2: आधुनिक पर्साॅ ह× यम (12h)
1. महोदयः - मुं ळपूॐड नारयणशास्त्रणः पुॐसंजीवन काॐ ये 2 सगः [
2. रामकीर्तिः [- सय्यं तशास्त्रणः श्रीरामकीर्ति महाका [ॅ ये 1 सगः [

Unit - 3: गर्साॅ ह× यम (12h)
1. खलोॅठॅॅः - श्रीहतोपदेशे सॅंॐ धं प्रॉरं छेदात्
2. लोकमाॐयः - श्रीरामनाथशास्त्र कृतः निबॅंधः

Unit - 4: व्याकरणम (12h)
1. अजॅंत शॉ दाः (देव, कॅ व, भानु, धातृ, ॅपतृ, गो, रमा, मति)
2. धातवः (भू, गम, ॅे था, Á शर, ॅ लाभ, ॅ मुॐ , अस, ॅ भाष)

Unit - 5: व्याकरणम (12h)
1. सॅंधयः (अच ॅ- हल ॅ सॅंधयः)
2. समासाः (ॐॐ , त× पुॐष, कमधारय [, ॐगु)

III Skill Outcomes:
On successful completion of this course, student shall be able to:
1. साॅ ह× यकार, ऋॅ ष, कॅ व ॅदय ॅववेचनम् भवति ।
2. मानवीयमूॅयसॅ पदनिभलाषः भवति ।
3. मौलिकव्याकरण£ ॅनेन ॅनियोगे अथात[ॅपठन लेखन वेलासु भाषाशुॅॅ यै ॅनियॐः भवति ।

IV References:
1. Prescribed Sanskrit **Text Book IV**

Co-Curricular Activities: (Hours for Activity: 15h)

1. Assignments

2. Seminars, Group discussions, Quiz, Debates etc.

3. Invited lectures and presentations on related topics by experts.

R23	**SEMESTER –I**	L	P	T	C
	I. Analytical Skills	4	0	--	4
	TOTAL CONTACT HOURS–30				

SYLLABUS

UNIT – 1:

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – 2:

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance – speed.

Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT – 3:

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, line Graphs. Venn diagrams.

COURSE OUTCOMES:

After successful completion of this course, the student will be able to;

CO1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.

CO2. Acquire competency in the use of verbal reasoning.

CO3. Apply the skills and competencies acquired in the related areas

CO4. Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

Recommended Co-Curricular Activities

Surprise tests / Viva-Voice / Problem solving/Group discussion.

Text Book: Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.Chand Publications.

Reference Books

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar,New Delhi-110055

2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.

3. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw HillPublications.

MAHARAH`S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

I B. Sc; First Semester Examinations Model Paper

ANALYTICAL SKILLS

Time: 1 ½ hrs   **Max.Marks:30M**

SECTION-A

I. Answer any THREE from the following   **3x2=6M**

1. The H.C.F of two numbers is 11 and their L.C.M is 7700.If one of the number is 275, then Find the other number?

2. If $\dfrac{2x}{1+\dfrac{1}{1+\dfrac{x}{1-x}}}=1$, then find the value of x?

3. A, B,C enter into a partnership investing Rs. 35000,45000 and 55,000 respectively. Find the respective shares of A,B,C in an annual profit of Rs. 40,500 ?

4. At what rate percent per annum will a sum of money double in 16 years?

5. How to find the central angle of the component?

SECTION-B

II. Answer all the following questions. Each question carries EIGHT marks.   3x8=24M

6 (a). Explain any four Divisibility Rules with relevant Examples.

(OR)

6(b). i) What was the day of week on 4ᵗʰ June,2002?

ii) Find at what time between 8 and 9 o'clock will the hands of a clock be in the same straight line but not together?

7(a). i) The present age of a father is 3 years more than three times the age of his son. Three years hence, father's age will be 10 years more than twice the age of the son,. Find the present age of the father?

ii) A cyclist covers a distance of 750m in 2 min 30 sec. What is the speed in km/hr of the cyclist?

(OR)

7(b). A salesman's commission is 5% on all sales up to Rs. 10,000 and 4% on all sales exceeding this. He remits Rs. 31,100 to his parent company after deducting his commission. Find the total sales.

8(a) . Study the following table carefully and answer these questions:

| Year	1997		1998		1999		2000		2001	
State	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

1. Combining the states P and Q together in 1998, what is the percentage of the candidates qualified to that of the candidates appeared?
   (a) 10.87%   (b) 11.49%   (c) 12.35%   (d)12.54%
2. The percentage of the total number of qualified candidates to the total number of appeared candidates among all the five states in 1999 is
   (a) 11.49%   (b)11.84%   (c) 12.21%   (d) 12.57%
3. What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?
   (a) 12.36%   (b) 12.16%   (c) 11.47%   (d) 11.15%
4. What is the average of candidates who appeared from State Q during the given years?
   (a) 8990   (b) 8760   (c)   8810   (d) 8920

(OR)

8(b). The following pie-charts show the distribution of students of graduate and post graduate levels in seven different institutes –M,N,P,Q,R,S and T in a town

DISTRIBUTION OF STUDENTS AT GRADUATE AND POST-GRADIATE LEVELS IN SEVEN INSTITUTIONS –M,N,P,Q,R,S and T

Total Number of Students of   Total Number of Students of
Graduate Level =27300 Post-Graduate Level = 24700
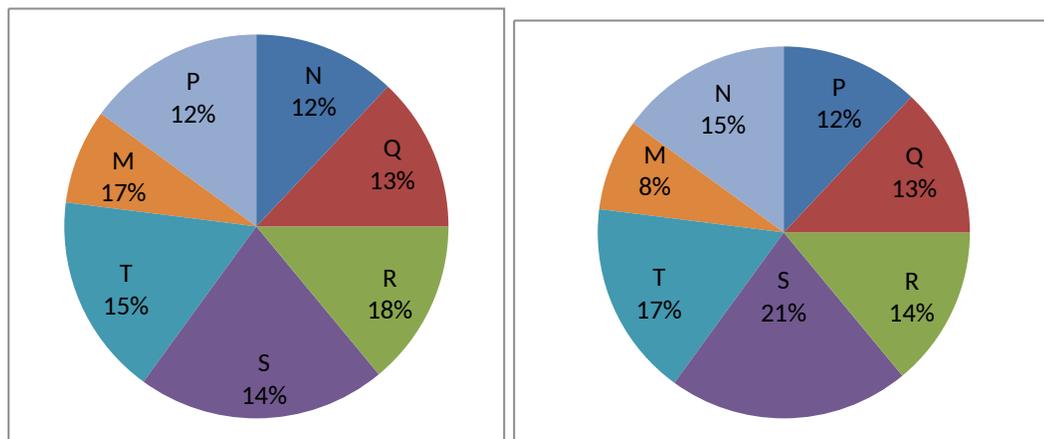
1. How many students of institutes M and S are studying at graduate level?
   (a) 7516   (b)8463   (c) 9127   (d) 9404
2. Total number of students studying at post-graduate level from institutes N and P is :

(a)5601   (b)5944   (c) 6669   (d) 7004

3. What is the total number of graduate and post – graduate level students in institute R?

(a) 8320   (b)7916   (c)9116   (d) 8372

4. What is the ratio between the number of students studying at post-graduate and graduate levels respectively from institute S?

(a) 14:19   (b) 19:21   (c) 17:21   (d) 19:14

R-23	SEMESTER – 1 LIFE SKILLS COURSE	T	P	C
	COURSE 4: COMMUNICATION SKILLS **SEMESTER I** (w.e.f 2023-24 Admitted Batch)	2	0	2
	Total Contact Hours - 20			

COURSE OBJECTIVES:

The objectives of the course are to make the student:

1. To know about the types interviews and how to face an interview.

2. To get an idea about communication and principles of communication, barriers to communication and effective communication.

3. To acquire the knowledge about Speaking Skills with reference to Dialogue Building and Giving Instructions /Directions.

5. To apply the knowledge for debating, Descriptions and Role Play.

SYLLABUS

I. UNIT   BASICS OF COMMUNICATION SKILLS

    1. Nature and Importance of Communication.

    2. Process of communication.

    3. Principles of Communication.

    4. Barriers to Communication.

    5. Strategies for Effective Communication.

II. UNIT   PRESENTATION SKILLS

    1. Preparation of a Good Presentation.

    2. Verbal Communication in Presentation.

    3. Non-Verbal Communication in Presentation.

    4. Visual aids/Materials in Presentation.

    5. Analyzing audience and Managing Questions.

III.UNIT   INTERVIEW AND GROUP DISCUSSIONS

1. Interview types.

2. Before, during and after an interview.

3. Do`s and Don'ts in an interview.

4. Basic interview questions.

5. Structure and process of Group Discussions.

6. Role functions, Do`s and Don`ts.

Learning outcomes:

By the end of the course the learner will be able to:

- Speak English fluently

- Participate confidently in any social interaction.
- Face any professional discourse.
- Demonstrate critical thinking.
- Enhance conversational skills by observing the professional interviews

Recommended Activities:

----Presenting seminar papers.

----Mock interviews.

----Using Power point presentation in seminars.

CO-CURRICULAR ACTIVITIES:
- Class Room Seminars.
- Elocution.
- Making a Presentation.
- Assignments.

TEXT BOOKS:

- English Praxis Course-III by Maruthi Publications.
- English Praxis Course-III by A Course in Conversational Skills by Vivanta Press.

REFERENCE BOOKS:

- Working in English, Jones, Cambridge.
- Business Communication, Raman – Prakash, Oxford.
- Speaking Personally, Porter – Ladousse, Cambridge.
- Speaking Effectively, Jermy Comfort, et.al, Cambridge.
- AnjaneeSethi&BhavanaAdhikari, Business Communication Tata McGraw Hill
- Jermy Comfort, Speaking Effectively,et,al, Cambridge.

<u>LMS ACCESS</u>

<u>Skills you need: communication skills</u>

- Information and resources to help develop information skills

Nonverbal Communication

<u>Principles of public speaking</u>

- Online course that aims to help you prepare and deliver effective oral presentations, with an emphasis on informative and persuasive public speaking

<u>33 Nonverbal Communication Tips, in 140 characters or less</u>

- Some short and succinct tips on improving your nonverbal communication skills

<u>Nonverbal communication: how body language & nonverbal cues are key</u>

- Article on nonverbal communication that includes some good tips on watching your body language during online video calls

<u>The power of nonverbal communication</u>

- TED talk from a body language expert

MAHARAJAH`S COLLEGE [AUTONOMOUS] ; VIZIANAGARAM

SEMESTER I -COMMUNICATION SKILLS -MODEL QUESTION PAPER
I B,A., B.Sc., B,COM FIRST YEAR w.e.f., 2023

Max. Time : 2 Hrs.   **Max. Marks : 30 M**

PART – A

1. **Answer any THREE of the following:**   **3X2 = 6 M**

   a. Define communication.

   b. What is communication process?

   c. Visual aids in presentation.

   d. What are Do`s in Interview?

   e. What is GD in communication?

PART-B

II. Answer any FIVE of the following: **3X8 = 24 M**

2   A] What is the nature and importance of communication?
                       OR
     B] Write a note on major barriers to communication?

3.   A] What are the strategies for effective communication?

                     OR
     B] Explain verbal and non-verbal communication in presentation.

4.   A] What is GD and write its importance.

                     OR
     B] What are the Do`s and Don`ts of Power Point Presentation?

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R23	SEMESTER-I	L	P	T	C
	PRINCIPLES OF PSYCHOLOGY	**2**	---	---	**2**
	TOTAL CONTACT HOURS – 30				

LEARNING OBJECTIVES:

1) To understand and apply psychological principles to real-world issues and problems.

2) To investigate the physiological, psychological, and social determinants of motivation.

3) To investigate the various types of memory, including short-term, long-term, and sensory memory.

4) To understand how personality traits impact an individual's behaviour and interactions with others.

SYLLABUS

UNIT - 1: INTRODUCTION

Definition, Origin of Psychology, Psychology as a scientific study of behaviour, Applied fields of Psychology, Biological bases of Behaviour. SENSORY AND PERCEPTUAL PROCESS: Structure and functions of visual and auditory senses; ATTENTION: selective, sustained and divided attention. PERCEPTION: Nature and determinants; Perceptual constancies.

UNIT - 2: EMOTION AND MOTIVATION:

Nature of Emotion, Components of Emotions. Theories of Emotion: James-Lange, Cannon - Bard and Schachter- singer. MOTIVATION: Nature and types of Motivation; Maslow's hierarchy model.

UNIT - 3: INDIVIDUAL DIFFERENCES:

Learning and Memory: Learning - Definition, Classical and Instrumental Conditioning, Principles of Classical Conditioning, Schedules of reinforcement, MemorySensory, Short- term and Long term memory; Forgetting and it's causes.PERSONALITY - Trait and type approaches; Assessment of Personality. INTELLIGENCE- Concept of IQ and Measurement

LEARNING OUTCOMES:

By the end of the course the learner will be able to:

- Speak fluently in English.
- Participate confidently in any social interaction.
- Face any professional discourse.
- Demonstrate critical thinking.
- Enhance conversational skills by observing the professional interviews.

LEARNING OUTCOMES:

1) Students able to improve mental health and well-being for individuals and communities through evidence-based interventions

2) The students able to enhance ability to motivate oneself and others to perform at their best.

3) The students able to improve academic and professional performance through better memory recall.

4) The students able to improve self-awareness and understanding of one's own personality traits.

ACTIVITIES:

Group Discussions; Debates; Assignments; Essay writings;

Seminars, Workshops, PPT Presentations, Charts and Poster Presentations etc.,

REFERENCE

BOOKS AND WEBSITES:

1) Aggarwal, J.C. (2014). Essentials of Educational Psychology (3rd Ed.).New Delhi: Vikas Publishing House Pvt.Ltd.
2) Bhartiya, H.R. (1968). Elements of Educational Psychology. Calcutta: OrientLongman.
3) Chauhan, S.S. (1984). Advanced Educational Psychology (7th Ed).New Delhi: Vikas Publishing House. Pvt. Ltd.
4) Mangal S.K. (2007) Advanced Educational Psychology (2nd Ed). New Delhi, Prentice Hall of India.

MAHARAJAH'S COLLEGE (AUTONOMOUS) - VIZIANAGARAM
MODEL QUESTION PAPER

SUBJECT/ PAPER: PRINCIPLES OF PSYCHOLOGY

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PART-A

1. Answer any FIVE questions from the fallowing.   **(3 x 2 = 6 M)**

   a. Write the meaning and definition of the Psychology?

   b. What is Educational Psychology?

   c. Define the Perception.

   d. Draw the cycle of Motivation?

   e. What are the causes of Forgetting?

PART-B

II. Answer THREE of the following internal choice questions.   **(3 x 8 = 24 M)**

2. a) Define the Attention and Explain the types of Attention?

                             (OR)

   b) Compare between Pure Psychology and Applied Psychology?

3. a) Explain and illustrate the Maslow's Hierarchy Model?

                             (OR)

   b) Discuss the Schedules of Reinforcement.

4. a) Explain the Classical Conditioning Theory?

                             (OR)

   b) Summarize the assessment of Personality

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM
SEMESTER-II

	Data Science major-2	L	T	P	C
R23	**Introduction To Data Science And R Programming**	**4**		**2**	**5**
	Total Contact Hours:60				

COURSE OBJECTIVES:

Data Science is a fast-growing interdisciplinary field, focusing on the analysis of data to extractknowledgeandinsight.Thiscoursewillintroducestudentstothecollection.Preparation,analysis, modelling and visualization of data, covering both conceptual and practical issues.

Examples and case studies from diverse fields will be presented, and hands- on use of statistical and data manipulation software will be included.

SYLLABUS

UNIT- I   (12 hrs)

Defining Data Science and Big data, Benefits and Uses, facets of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts

UNIT- II   (12 hrs)

The Data Science Process: Overview of the Data Science Process-Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, data Presentation and Automation. Getting Data in and out of R, Using reader package, Interfaces to the outside world.

UNIT- III   (12 hrs)

Machine Learning: Understanding why data scientists use machine learning-What is machine learning and why we should care about, Applications of machine learning in data science, Where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT- IV   (12 hrs)

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets.

UNIT- V   (12 hrs)

Sub setting R objects, Vectorised Operations, Managing Data Frames with the dplyr, Control structures, functions, Scoping rules of R, Coding Standards in R, Loop Functions, Debugging, Simulation. Case studies on preliminary data analysis.

REFERENCE BOOKS:

1. Davy Cielen, Arno.D.B.Maysman, Mohamed Ali,"Introducing Data Science" Manning Publications, 2016.

2. Roger D.Peng,"RProgramming for Data Science" LeanPublishing,2015.

LEARNING OUTCOMES OF COURSE:

CO1: Recognize the various discipline that contribute to a successful data science effort.

CO2: Understand the processes of data science identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.

CO3: Beaware of the challenges that arise in Data Sciences.

CO4: Be able to identify the application of the type of algorithm based on the type of the problem.

CO5: Be comfortable using commercial and open source tools such as the R/Python language and its associated libraries for data analytics and Visualization.

Lab/Practical/Experiments/Tutorials syllabus:

1. Installing R and R studio, with proper not eson version management, cosmetic settings and different libraries.

2. Basic operations in r with arithmetic and statistics.

3. Getting data into R, Basic data manipulation, Loading Data into R

4. Basic plotting

5. Loops and functions

6. Create Vectors, Lists, Arrays, Matrices, Data frames and operations on them.

7. Demonstratethevisualizationandgraphicsusingvisualizationpackageslikeggplot2.

8. Implement Loop functions with lapply(),sapply(),tapply(),apply(),mapply().

9. Explore data using SingleVariables:Unimodal,Bimodal,Histograms,DensityPlots,Barcharts

10. ExploredatausingtwoVariables:Lineplots,ScatterPlots,smoothingcures,Barcharts

11. Explore and implement commands using dplyr package

R23	Data Science–major-1	L	T	P	C
	DESCRIPTIVE STATISITCS	4		2	5
	Total Contact Hours:60				

COURSE OBJECTIVES:

1. The objective of this paper is to throw light on the role of statistics in different fields with special reference to business and economics.
2. It gives the students to review good practice in presentation and the format most applicable to their own data.
3. The measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
4. The measures of dispersion throw light on reliability of average and control of variability
5. The concept of Correlation and Linear Regression deals with studying the linear relationship between two or more variables, which is needed to analyze the real life problems.
6. The attributes gives an idea that how to deal with qualitative data.

PRE-REQUISITIES: Data , Measures of Central Tendency, Measures Dispersion

SYLLABUS

UNIT–1 **(12hrs)**

Introduction to Statistics: Importance of Statistics. Scope of Statistics in different fields.Concepts of primary and secondary data. Diagrammatic and graphical representation of data: Histogram, frequency polygon, Ogives, Pie. Measures of Central Tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean. Median and Mode through graph.

UNIT–2 **(12hrs)**

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non-Central moments and their inter relationship. Skewness and kurtosis.

UNIT–3 **(12 hrs)**

Curve fitting: Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, fitting of Second degree polynomial or parabola, fitting of power curve and exponential curves.

Correlation: Meaning, Types of Correlation, And Measures of Correlation: Scatter diagram,Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and with outties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Concept of multiple and partial correlation coefficients (three variables only) and properties

<div align="center">

UNIT–4   **(12hrs)**

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Regression: Concept of Regression, Linear Regression: Regression lines, Regression coefficients and its properties, Regressions lines for bi-variate data and simple problems. Correlation vs. regression, Sigmoid curve, Derivation from linear regression to logistic regression.

<div align="center">

UNIT–5   **(12hrs)**

</div>

Attributes: Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only, Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingency table: Square contingency**,** Mean square contingency, Coefficient of mean square contingency, Tschuprow's coefficient of contingency.

CO-CURRICULAR ACTIVITIES:

Seminar/ Quiz/Assignment/Problem solving/Solving Previous PGCET papers.

REFERENCE BOOKS:

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

2. O.P.Gupta: Mathematical Statistics, Kedarnath Ramnath &Co.

3. P.N.Arora &S.Arora: Quantitative Aptitude Statistics –VolII, S.Chand &Company Ltd.

4. K. Rohatgi&EhsanesSaleh: An Introduction to Probability and Statistics, John Wi

   ley&Sons.

5. BA/BSc I year statistics-descriptive statistics, probability distribution-Telugu Academy

   DrM.JaganmohanRao,DrN.SrinivasaRao,DrP.TirupathiRao,Smt.D.Vijayalakshmi.

COURSE OUTCOMES:

Students will acquire:

CO1:Knowledge of Statistics and it scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.

CO2: Knowledge of various types of data, their organizationandevaluationofsummarymeasuressuchasmeasuresofcentraltendencyanddispersio netc.

CO3: Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,

CO4: Insights into preliminary exploration of different types of data.

CO5: Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

PRACTICALS-(2hrs)

1. Graphical presentation of data (Histogram, frequency polygon, Ogives).

2. Diagrammatic presentation of data (Barand Pie).

3. Computation of measures of central tendency(Mean,MedianandMode)

4. Computation of measures of dispersion(Q.D, M.Dends')

5. Computation of non-central, central moments,$\beta_1$and$\beta_2$forungroupeddata.

6. ComputationofKarlPearson'scoefficientsofSkewnessandBowley'scoefficientsof
    Skewness.

7. Fitting of straight line by the method of least squares

8. Fitting of parabola by the method of least squares

9. Fitting of power curve of the type by the method of least squares.

10.Fitting of exponential curve of the type and by the method of least squares.

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

COURSE INFORMATION SHEET

Program : General Telugu
Year and semester : II Semester
Course : **Srujanaatmaka Rachana (సృజనాత్మక రచన)**
Course Name : TELUGU
Course Coordinator :
Total Number of hours : 60
Internal Marks : 40
External Marks : 60

Lecture	Tutorial	Practical	No. Of Hrs per week	Credits
4	0	0	4	4

Course Objectives (అభ్యాసన లక్ష్యాలు):

1. Develop proficiency in reading, writing, and speaking skills
2. Introduce students to classical Telugu literature, including epics, poetry, drama, and philosophical texts.
3. Enhance knowledge of Telugu grammar (Vyakaranam).
4. Provide insights into Indian culture, philosophy, and heritage as reflected in Telugu texts.
5. Encourage the use of Telugu in modern contexts, including employability in education, research, and technology.

Course Outcomes (అభ్యాసన ఫలితాలు);

1. Demonstrate proficiency in Telugu through effective communication, both oral and written.
2. Analyze and interpret classical texts and apply their teachings to contemporary life.
3. Exhibit a clear understanding of Telugu grammar and its application in constructing verses and prose.
4. Develop skills for translation and interpretation of Telugu texts into modern languages.
5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

I-BA, BSC, BCOM డిగ్రీ జనరల్ తెలుగు సెమిస్టర్ -II

పాఠ్యప్రణాళిక - 2021-2022

మహారాజా కళాశాల (స్వయంప్రతిపత్తి). విజయనగరం

క్రమ సంఖ్య	యూనిట్-I : ఆధునిక కవిత్వం	బోధన సమయం 9 గంటలు
1.	ఆధునిక కవిత్వం- పరిచయం	3 గంటలు
2.	కొండవీడు - దువ్వూరి రామిరెడ్డి	2 గంటలు
3.	మాతృసంగీతం - అనిసెట్టి సుబ్బారావు	2 గంటలు
4.	'తాతకో నూలుపోగు' - బండారు ప్రసాదమూర్తి	2 గంటలు

క్రమ సంఖ్య	యూనిట్-II : కథానిక	బోధన సమయం 9 గంటలు
1.	తెలుగు కథానిక - పరిచయం	4 గంటలు
2.	భయం (కథ) - కాళీపట్నం రామారావు	3 గంటలు
3.	స్వేదం ఖరీదు....? - రెంటాల నాగేశ్వరరావు	2 గంటలు

క్రమ సంఖ్య	యూనిట్-III : నవల	బోధన సమయం 13 గంటలు
1.	తెలుగు 'నవల' పరిచయం	4 గంటలు
2.	రథచక్రాలు (నవల) - మహీధర రామ్మోహన రావు	5 గంటలు
3.	రథచక్రాలు (సమీక్షా వ్యాసం) - డా॥ యల్లాప్రగడ మల్లికార్జునరావు	2 గంటలు

క్రమ సంఖ్య	యూనిట్-IV : నాటకం	బోధన సమయం 12 గంటలు
1.	తెలుగు 'నాటకం' - పరిచయం	4 గంటలు
2.	యక్షగానము (నాటిక) - ఎం.వి.ఎస్. హరనాథరావు,	5 గంటలు
3.	"అపురూప కళారూపాల విధ్వంసదృశ్యం 'యక్షగానము' (సమీక్షా వ్యాసం)" - డా॥ కందిమళ్ళ సాంబశివరావు	3 గంటలు

క్రమ సంఖ్య	యూనిట్-V: విమర్శ	బోధన సమయం 8 గంటలు
1.	తెలుగు సాహిత్య విమర్శ- పరిచయం	3 గంటలు
2.	విమర్శ-స్వరూప స్వభావాలు; ఉత్తమ విమర్శకుడు-లక్షణాలు	5 గంటలు

క్రమ సంఖ్య	అటానమస్ లో భాగంగా అదనపు సమాచారం - జర్నలిజం	బోధన సమయం 5 గంటలు
1.	ఏది వార్త ?	1 గంట
2.	వార్తా ఆధారాలు	1 గంట
3.	వార్తా భేదాలు	1 గంట
4.	వార్తా సేకరణ పద్ధతులు	2 గంటలు

	పునశ్చరణ	4 గంటలు

అంశాలు	బోధన సమయం
యూనిట్ – I	9 గంటలు
యూనిట్ – II	9 గంటలు
యూనిట్ – III	13 గంటలు
యూనిట్ – IV	12 గంటలు
యూనిట్ – V	8 గంటలు
యూనిట్ – VI	5 గంటలు
పునశ్చరణ	4 గంటలు
మొత్తం	**60 గంటలు**

GENERAL INFORMATION

R23	Lecture	Tutorial	Practical	Credits	Progr am
	4	0	0	4	

: General Sanskrit

Year and Semester   **: II Semester**

Course   **: POETRY, PROSE & GRAMMER -II**

Course Name   **: SANSKRIT**

Course Coordinator   **:**

Total Number of hours   **: 60**

Internal Marks   **: 40**

External Marks   **: 60**

Course 2: POETRY, PROSE & GRAMMER -II

Course Objectives

1. Develop proficiency in reading, writing, and speaking skills

2. Introduce students to classical Sanskrit literature, including epics, poetry, drama, and philosophical texts.

3. Enhance knowledge of Sanskrit grammar (Vyakarana).

4. Provide insights into Indian culture, philosophy, and heritage as reflected in Sanskrit texts.

5. Encourage the use of Sanskrit in modern contexts, including employability in education, research, and technology.

Course Outcomes;

1. Demonstrate proficiency in Sanskrit through effective communication, both oral and written.

2. Analyze and interpret classical texts and apply their teachings to contemporary life.

3. Exhibit a clear understanding of Sanskrit grammar and its application in constructing verses and prose.

4. Develop skills for translation and interpretation of Sanskrit texts into modern languages.

5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

I. Learning Outcomes:

1. संे कृ त पं कठ वॆ योग माधुयानोॢभूितः भवित ।
2. संे कृ त गं कठ वॆ योग माधुयानोॢभूितः भवित ।
3. ैयाकरण£ ॎनात्लखे नशॊठॖ ः भवित ।

II. Syllabus: (Teaching Hours: 60)

Unit - 1: ॎाचीन पं साॊ ह꣯ यम (12h)

1. पाॊ णॆ हणम - ॢरघुवꣳ शमहाकाꣳ ये 7 सगः [
2. पॷ ॎचान[म - ॎनानाॏ थॏ यः

.Unit - 2: आधुिनक पं साॊ ह꣯ यम (12h)

1. पॏ नाधाॷ ॎी – ।ॎीम꣯ॏ तापरणायनेमेवाडकाॊ डे 13 सगः [
2. सुखवगः [– धꣳ मपदम **(Sanskrit Version of Prof. P.Sriramachandrudu)**

Unit - 3: गं साॊ ह꣯ यम (12h)

1. अमोघदशन[म - ॢबाणꣳ य कादंबर8 तः
2. चाꣳ चेॕyतम ॎ- कठ वकोपकलापतः

Unit - 4: ैयाकरणम (12h)

1. अजॏ त शॎ दाः (नद8 ,तनु, वधू, मातृ, वन, फल, वाॕ र, मधु)
2. धातवः (इष, ॎिलख, ॢकृञ, Ðंॕञ, ॢचरु, ॢरमु, वॏॖ ,युध)

Unit - 5: ैयाकरणम (12h)

1. सॏ धयः (हल ॢसॏॷॏधः – ॊ वसगसॏ[ॏॷॏधः)
2. समासाः (अं यायीभावः, बहुां ॎीॊ हः)

III Skill Outcomes:

On successful completion of this course, student shall be able to:
1. संे कृ तकवीनां पदवाॆ यॆ योगसरणेरविगतः भवित ।
2. संे कृतकवीनां भावगꣳ भीय पाॎ[र£ ॎनम ॎभवित ।
3. वाॆ यरचनायाम ॢदोषराॊ ह꣯ यॆ ॎिॹ ः भवित ।

IV References:

1. Prescribed Sanskrit **Text Book II**

V. Co-Curricular Activities: (Hours for Activity: 15h)

1. Assignments

2. Seminars, Group discussions, Quiz, Debates etc.

3. Invited lectures and presentations on related topics by experts.

	SEMESTER – 2	T	P	C
R -23	**READING & WRITING SKILLS** **English Praxis Course-II** (w.e.f 2023 -24 Admitted Batch)	4	0	3

COURSE OBJECTIVES:

The objectives of this course are to make the students:

To get an overall idea about the topics from literature with reference to Tennyson, Robert Frost, Abrar Mohsin, Ruskin Bond, A. J. Cronin, Nissam Ezekiel and R.K.Narayan.

- To Acquire with Vocabulary: Conversion of words, one word substitutes and collocations.
- To Familiarize with reading comprehension and Note making / taking.
- To acquire the knowledge about preparation of Notices, Agendas and Minutes.
- To learn how to write Curriculum Vitae and Resume, Letters, E-Correspondence.

SYLLABUS:

UNIT – I: (10Hrs)

Poetry : Ulysses – Alfred Lord Tennyson

Skills : 1.Vocabulary: Conversion of Words.

    2. One Word Substitutes.

    3. Collocations.

UNIT – II (8Hrs)

Prose : The Best Investment I Ever

        Made –A.J. Cronin

Poetry : Ode to the West Wind   PB Shelley.

Non-Detailed Text : Florence Nightingale   Abrar Mohsin.

Skills : Skimming and Scanning.

UNIT – III   (11Hrs)

Prose   :1.TheNightTrain at Deoli   Ruskin Bond.

Poetry   :2.Stopping by Woods on a

                         Snowy Evening   Robert Frost

Skills   :   1. Reading Comprehension (Top

                         Down, Bottom Up &Scheme

                         Theory)

                     :2. Note Making/Taking.

                               Nissim Ezekiel

UNIT – IV   (9hrs)

Poetry   :Night of the Scorpion

Skills   : 1.Expansion of Ideas.

                         : 2.Notice, Agendas and Minutes.

UNIT – V   (12Hrs)

Non-Detailed Text   : An Astrologer's Day   RK Narayan.

Skills :   1.CurriculumVitae and Resume.

                         2. Letters.

                         3. E-Correspondence.

LEARNING OUTCOMES:

By the end of the course the learner will be able to**:**

- Use reading skills effectively.
- Comprehend different texts.
- Build up a repository of active vocabulary.
- Improve writing skills independently for future needs.
- Enhance communicative competence through Reading and Writing Skills

Activities:

    -- Asking the students to prepare a model resume.

    -- Quiz on one word substitutes.

    -- Pair activity on collocations.

    -- Asking the students to read news's paper clippings and make notes.

CO-CURRICULAR ACTIVITIES:

- Class Room Seminars.
- Student Projects.
- JAM Sessions.
- Assignments.

TEXT BOOKS:

- English Praxis Course-II by Maruthi Publications.
- English Praxis Course-II by A Course on Communication and Soft skills by Vivanta Press.

REFERENCE BOOKS:

- Black book of English Vocabulary by Nikhil Gupta.
- Advanced Writing skills for Skill Builders by D.S.Paul.
- Improving Reading Comprehension and Speed, Skimming and scanning- Reading for Pleasure by Marcia J. Coman and Kanthy L. Heavers.

LMS ACCESS:

1. https://www.goodreads.com/author/show/1305302.R_K_Narayan

2. ESL Gold (https://www.eslgold.com/) - ESL Gold offers a range of resources for learners of English, including grammar lessons, vocabulary exercises, and conversation practice.

3. Breaking News English (https://breakingnewsenglish.com/) - Breaking News English offers news articles and related exercises for learners of English, with a focus on vocabulary and comprehension.

4. My Language Exchange (https://www.mylanguageexchange.com/) - My Language Exchange is a language exchange platform that allows you to connect with native English speakers for conversation practice.

5. https://www.studocu.com/in/z/37601931?sid=01734585498 [proverbs]

R-23	SEMESTER – II LIFE SKILLS COURSE	T	P	C
	COURSE: BUSINESS WRITING (w.e.f 2023-24 Admitted Batch)	2	0	2

SYLLABUS

Unit-I   10 hrs

Introduction to Business Writing: Importance and purpose of effective business writing; Characteristics of good business writing; Common challenges and misconceptions. Writing Clear and Concise Emails: Appropriate email etiquette in the professional environment, organizing email content and using effective subject lines, Understanding tone and formality in email communication.

Unit-II   10 hrs

Memos and Interoffice Communication: Formatting and structure of memos, Writing memos for various purposes like updates, announcements, requests. Ensuring clarity and coherence in interoffice communication. Business Letters and Formal Correspondence: Structure and components of a business letter, writing persuasive and professional business letters, Responding to inquiries and complaints effectively.

Unit-III   10 hrs

Business Proposals and Reports: Crafting business proosals for projects and initiatives, Formal report writing - format, sections, and organization, Analyzing data and presenting findings in reports. Writing for Digital Platforms: Business writing for websites, social media, and online communication, Leveraging technology for efficient and impactful

COURSE OUT COMES:

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

1. Understand the fundamentals of business writing, including style, tone, and language.

2. Produce well-structured and concise business documents, such as emails, memos, and reports.

3. Apply principles of effective communication in business letters and interoffice correspondence.

4. Craft persuasive and well-organized business proposals and formal reports.

5. Cultivate a professional and ethical approach to business writing.

Text Books:

1. Business Writing Basics by Jane Watson (Author) Publisher: Self Counsel Press Inc;
2nd edition (1 August 2002) ISBN-10: 1551803860 ISBN-13: 978-1551803869

2. Successful Business Writing - How to Write Business Letters, Emails, Reports,
Minutes and for Social Media - Improve Your English Writing and Grammar: of
Exercises and Free Downloadable Workbook by Heather Baker Publisher: Universe
of Learning Ltd; Illustrated edition (1 March 2012) ISBN-10 : 1849370745 ISBN-13
: 978-1849370745

3. Business Correspondence and Report Writing, 6th Edition by R C Sharma, Krishna
Mohan, Virendra Singh Nirban. Publisher: McGraw Hill Education (India) Private
Limited. ISBN-10: 9390113008 ISBN-13: 978-9390113002

Reference Books:

1. "The Essential Business Handbook: The Nuts & Bolts of Getting Up and Running
Fast" by John Storey and Amelia Storey (Indian Edition)

2. "The AMA Handbook of Business Writing: The Ultimate Guide to Style, Grammar,
Punctuation, Usage, Construction, and Formatting" by Kevin Wilson and Jennifer Wauso

1.Business communication for success

- Free online textbook covering oral and written business communications

2.Effective email communication

- The University of North Carolina's Writing Center guide to help you communicate more effectively using e-mail.

I Degree - LIFE SKILLS COURSES

R23		SEMESTER II	L	T	P	C
	Major/ Minor	DIGITAL LITERACY (w.e.f.2023-24AdmittedBatch)	2	2	0	2
		Total Hours -30				

SYLLABUS

Unit-I   10hrs

Operate the elements of a computer and performing operations on the computer

Operate the elements of a computer including power cord, power switch, network connecting cable, USB ports, Mouse operations, Keyboard operations, interface icons, GUI elements, Editing options, perform operations including switching on the computer, logging in, locating a file, opening a file, printing a document, storing a file with proper extension, creating a folder/ sub folder in a volume on hard disk and desktop, shifting files from one folder to another, shutting off the computer

Unit-II   10hrs

Access the Internet to browse information and E-mail operation

Access the Internet, use a search engine, find information on the topic of interest, register for a web-based E-mail account, access E-mail with attachments, reply to an E-mail, forward an E-mail and delete an E-mail message

Unit-III   10hrs

Make bill payments, other applications using Internet and word processing

Make utility bill payments, booking bus/train tickets, bank transactions, personal transactions, job search through employment portals, mobile/DTH recharge, word processing basics, creating, editing and formatting of text, saving and printing of word document

COURSE OUTCOMES

By undergoing the Digital Literacy course, one should acquire basic knowledge on Computer and he/she is able to

CO1: Perform operations on the computer

CO2: Access the Internet and finding information of interest

CO3: Register for an E-mail account and operating it

CO4: Make bill payments and use other applications of Internet

CO5: Create, edit and format documents using a word processor

Course Duration: 30 Hours

Prescribed readings:

Appreciation of Digital Literacy Handbook published by Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India.

Web Resources:

1. https://youtu.be/b2X_j5Bz-VM
2. https://youtu.be/jln3-P6L2ro
3. https://youtu.be/cfDisqUMIvw
4. https://youtu.be/3h_PyURcdrc
5. https://youtu.be/EqN0LBcydBg

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

B.Sc. DATA SCIENCE - MAJOR

R23	SEMESTER - III	L	T	P	C
	COURSE 5: PYTHON PROGRAMMING FOR DATA ANALYSIS (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

AIM AND OBJECTIVES OF COURSE:
- To be able to Program in Python
- To know and understand the data Analysis phases.
- To know the usage of all libraries

UNIT I   9hrs
What is Data Analysis? Differences between Data Analysis and Analytics, what is Python, Why Python for Data Analysis? What is Library, Essential Python Libraries. Python Language basics, I Python and Jupyter Notebook. Python Language Basics.

UNIT II   9hrs
Built-in Data Structures, Functions, Files and Operating System. NumPy Basics: Arrays and Vectorized Computation, The Numpy ndarray, Universal Functions, Array-Oriented Programming with Arrays, File Input and Output with Arrays, Linear Algebra, Pseudorandom Number Generation.

UNIT III   9hrs
Getting Started with Pandas: Introduction to Pandas Data Structures, Essential Functionality, Summarizing and Computing Descriptive Statistics
Data Loading, Storage and File Formats: Reading and Writing Data in Text Format, Binary Data Formats, Interacting with Web APIs, Interacting with Databases.

UNIT IV   9hrs
Data Cleaning and Preparation: Handling Missing Data, Data Transformation, String Manipulation.
Data Wrangling: Join, Combine and Reshape: Hierarchical Indexing, Combining and Merging Datasets, Reshaping and Pivoting.

UNIT V   9hrs
Introduction to Modeling Libraries in Python: Interfacing between pandas and Model code, Creating model descriptions with Patsy, Introduction to stats models.
Plotting and Visualization: A brief matplotlib APT Primer, Plotting with Pandas and Seaborn, Other Python visualization tools.

COURSE OUTCOMES :

CO1: Understands and learn all basic concepts of

CO2: Python Program Data Analysis methods in Python

CO3:Get used to Python Programming environments.

TEXTBOOKS:
1. Wes McKinney "Python for Data Analysis" 0 'reilly Publications Second edition
2. Charles R Suverance "Python for Everybody" Exploring data using Python 3

REFERENCE BOOKS:
1. John Zelle Michael Smith Python Programming, second edition 2010

Web links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

B.Sc. DATA SCIENCE - MAJOR

LIST OF PRACTICAL EXPERIMENTS

1. Use matplotlib and plot an inline in Jupyter.

2. Implement commands of Python Language basics

3. Create Tuples, Lists and illustrate slicing conventions.

4. Create built-in sequence functions.

5. Create a functional pattern to modify the strings in a high level.

6. Create an n array object and use operations on it.

7. Use arithmetic operations on Numpy Arrays

8. Create an image plot from a two-dimensional array of function values.

9. Implement some basic array statistical methods and sorting with sortmethod.

10. Implement numpy. random functions.

11. Plot the first 100 values on the values obtained from random walks.

12. Implement the methods of descriptive and summary statistics

13. Transform the data using function or mapping

Lab Outcomes:

- Students will connect, join, and blend heterogeneous data sources into a unified Tableau worksheet.
- Students will generate and refine univariate charts using filters, colors, and labels for clarity.
- Students will design charts encoding 2+ variables with color, shape, and size for trend analysis.
- Students will create interactive maps and overlay demographic/geographic data for spatial insights.
- Students will build formulas and table calculations to enhance datasets and dashboards.
- Students will generate filtered extracts and evaluate efficiency vs. live connections.
- Students will publish workbooks, set permissions, and embed visualizations externally
- Students will share charts/data in multiple formats for cross-platform use.

	SEMESTER-III	L	T	P	C
R23	**INFERENTIAL AND APPLIED STATISTICS**	4	3	2	5
	Total Contact Hous:60				

COURSE OBJECTIVES:

1. This paper deals with standard sampling distributions like Chi Square, t and F and their characteristics and applications.

2. This paper deals with the different techniques of point estimation for estimating the
   Parameter values of population and interval estimation for population parameters.

3. In this paper, various topics of Inferential Statistics such as interval estimation, Testing of Hypothesis, large sample tests (Z-test), small sample tests (t-test, F-test, chi-square test) and non-parametric tests are dealt with. These techniques play an important role in many fields like pharmaceutical, agricultural, medical etc.

4. To determine the components of time series.

5. Compute the index numbers using various formulae.

6. Determining the number of births, deaths, marriages and divorces that occur with in the nation.

PRE-REQUISITIES: Measures of central Tendency, Measures of dispersion.

SYLLABUS

UNIT-I   9hrs

Concepts: Population, Sample, Parameter, statistic, Sampling distribution, Standard error. Convergence in probability and convergence in distribution, law of large numbers, central limit theorem (statements only).Student's t- distribution, F – Distribution, χ^2 -Distribution: Definitions, properties and their applications.

UNIT-II   9hrs

Theory of estimation and Hypothesis: Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, &sufficiency and. Binomial, Poisson& Normal Populationparameters estimate by MLE method, Confidence Intervals. Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test. Nyman Pearson lemma theorem, Examples in case of Binomial, Poisson and Normal distributions.

UNIT-III   9hrs

Sample tests: t-test for single mean, difference of means and paired- t intervals for mean(s).Standard deviation and correlation coefficient(s).Test for goodness of fit and independence of attributes. F-test for equality of variances. Non-parametric tests-their advantages and disadvantages, comparison with parametric tests. Measurement scale-nominal, ordinal, interval and ratio.

UNIT-IV   9hrs

Time Series: Time Series and its components with illustrations, additive, multiplicative models. Trends: Estimation of trend by free hand curve method, method of semi averages. Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method.

UNIT-V   9hrs

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics.Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables: construction and uses of life tables.

COURSE OUTCOMES:

Students will acquire:

- CO1: Concept of law large numbers and their uses.
- CO2: Knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts.
- CO3: Knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations.
- CO4: Concept about non-parametric method and some important non-parametrictests.
- CO5: Time series data, its applications to various fields and components of time series.
- CO6: Various data collection methods enabling to have a better insight in policy making, planning and systematic implementation, Construction and implementation of life tables, Population growth curves, population estimates and projections.

Real data implementation of various demographic concepts as outlined above through practical assignments

CO-CURRICULAR ACTIVITIES:

Seminar/ Quiz/Assignment/Problem solving/Solving Previous PGCET papers.

REFERENCE BOOKS:

1. BA/BScII yearstatistics-statisticalmethodsandinference-
   TeluguAcademybyA.Mohanrao,N.SrinivasaRao,DrR.SudhakarReddy,DrT.C.Ravichandra
   Kumar.

2. K.V.S.Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

3. Fundamentals of applied statistics: VKK apoorand SC Gupta.

4. BA/BScIIIyearpaper-appliedstatistics-Teluguacademyprof.K.Srinivasa

PRACTICALS– COURSE–VI (2HRS)

1. Large sample test for difference of means.
2. Large sample test for single proportion
3. Large sample test for difference of proportions, standard deviations, correlation coefficient.
4. Small sample test for single mean, difference of means and correlation coefficient.
5. Paired t-test (paired samples).
6. Small sample test for single variance(χ^2-test).

Time Series:

7. Measurement of trend by method of moving averages (odd and even period).
8. Measurement of trend by method of Least squares(linear and parabola).
9. Determination of seasonal indices by method simple averages.
10.   Determination of seasonal indices by method of Ratio to moving averages.

Vital Statistics:

11. Computation of various Mortality rates.
12. Computation of various Fertility rates.
13. Computation of various Reproduction rates.
14. Construction of Life Tables.

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B.Sc. DATA SCIENCE - MAJOR

	SEMESTER – III	L	T	P	C
R23	**COURSE 7: DATA MINING TECHNIQUES USING R** (w.e.f. 2023-24 Admitted Batch)	**5**	**3**	**2**	**4** (3+1)
	Total Contact Hours – 45				

AIM AND OBJECTIVES OF COURSE:
- To understand Data mining techniques and algorithms.
- Comprehend the data mining environments and application.

UNIT I   9hrs
An idea on Data Warehouse, Data mining-KDD versus data mining, Stages of the Data Mining Process-Task primitives., Data Mining Techniques - Data mining knowledge representation.

UNIT II   9hrs
Data mining query languages- Integration of Data Mining System with a Data Warehouse- Issues, Data pre-processing - Data Cleaning, Data transformation - Feature selection - Dimensionality reduction

UNIT III   9hrs
Concept Description: Characterization and comparison What is Concept Description, Data Generalization by Attribute-Oriented Induction(AOI), AOI for Data Characterization, Efficient Implementation of AOL, Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Frequent item set Mining Methods: Apriori method, generating Association Rules, lrnproving the Efficiency of Apriori, Pattern-Growth Approach for mining Frequent Item sets.

UNIT-IV   9hrs
Classification Basic Concepts: Basic Concepts, Decision Tree Induction: Decision Tree lnduction Algorithm, Attribute Selection Measures, Tree Pruning. Bayes Classification Methods.

UNIT-V   9hrs
Association rule mining: Antecedent, consequent, muti-relational association rules, ECLAT. Case study on Market Basket Analysis.
Cluster Analysis: Cluster Analysis, Partitioning Methods, Hierarchal methods, Density based methods-DBSCAN.

COURSE OUTCOMES :

CO1 : Students who complete this course will be able to

CO2: Compare various conceptions of data mining as evidenced in both research and application.

CO3: Evaluate mathematical methods underlying the effective application of data mining.

CO4: Should be able to apply the type of techniques based on the problems considered.

CO5: Can find out the market patterns and associations amongst different products.

TEXTBOOKS:

1. Jiawei Han, MichelineKamber, Jian Pei."Data Mining: Concepts and Techniques", 3rd Edition,Morgan Kaufmann Publishers, 2011.
2. AdelchiAzzalini, Bruno Scapa, "Data Analysis and Data mining" , 2ndEdiiton, Oxford Univeristy Press Inc., 2012.
3. Data Mining, The Textbook (2015) by Charu Aggarwal.

REFERENCES BOOKS:

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", 10thEdition, TataMc Graw Hill Edition , 2007.
2. G.K. Gupta, "Introduction to Data Mining with Case Studies", 1st Edition, EasterEconomyEdition, PHI, 2006.

Web links:
www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

LIST OF PRACTICAL EXPERIMENTS

1. Get and Clean data using dplyr exercises.

2. Visualize all Statistical measures (Mean, Mode, Median, Range, Interquartile Range etc., using Histograms, Boxplots and Scatter Plots).

3. Write R Programs to implement k-means clustering, k-medoids clustering and density-based clustering on any datasets.

4. Write a R Program to implement decision trees using 'reading Skills' dataset.

5. Implement decision trees using any dataset using package party and 'rpart'.

6. Generate top 5 association rules using apriori.

7. Generate top 5 association rules using ECLAT.

8. Write an R program to implement Naive bayes Classification.

LAB OUTCOMES:

- Students are able to analyze different pre processing techniques by implementing them using R language.

- Students will get clear understanding of some of classification and clustering algorithms familiar in data mining.

	SEMESTER – III	L	T	P	C
R23	**COURSE 8: WEB TECHNOLOGIES** (w.e.f. 2023-24 Admitted Batch)	5	3	2	**4 (3+1)**
	Total Contact Hours - 45				

COURSE OBJECTIVES:

- This subject enables the student to create flexible, attractive, user-friendly web sites comprised of both static and dynamic web pages.
- Along with that students will also learn about interactions with web pages through JavaScript and host own web site on internet.

UNIT I   9hrs

HTML: Basic HTML Tags and Attributes, Document body, Text, Hyperlinks, Adding moreFormatting, Lists, Tables, Grouping, Images. More HTML: Multimedia Objects, Frames, Forms, Headers.

UNIT II   9hrs

Cascading Style Sheets: Introduction, Syntax, Selectors, Background Cursors, Text Fonts, Lists, Tables, Box Model, Using Styles, Simple Examples, Creation of Own Styles, Properties And Values In Styles, Formatting Blocks of Information, Layers.

UNIT III   9hrs

Introduction to JavaScript: What is DHTML, JavaScript Basics, Variables, String Manipulations, Mathematical Functions, Statements, Operators, Arrays and Functions.

UNIT IV   9hrs

DHTML with JavaScript: Data Validation, Opening A New Window, Messages and Confirmations, Status Bar, Different Frames, Rollover Buttons, Moving Images.

UNIT V   9hrs

XML: Defining Data for Web Applications, Basic XML, Document Type Definition, Presenting XML, Document Object Model, Web Services.

LEARNING OUTCOMES:

- After Studying this subject student would have capability to make their own web site and hoston internet.
- Also students would have enough knowledge about the technologies used in internet.

TEXT BOOKS:

- Harvey M. Deitel and Paul J. Deitel, "Internet & World Wide Web How to Program", 4/e,Pearson Education.
- Uttam Kumar Roy, Web Technologies from Oxford University Press Student Activities.

Web links:
www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

LIST OF PRACTICAL EXPERIMENTS

1. Design web pages for your college containing a description of the courses, departments, faculties, library etc, use href, list tags.
2. Create your class timetable using table tag.
3. Create a feedback form for your curriculum. Use textbox, text area, checkbox, radio button etc
4. Write html code to develop a webpage having two frames that divide the webpage into two equal rows and then divide the row into equal columns fill each frame with a different background color.
5. Create your resume using HTML tags. Experiment with colors, text, link, size and other tags you studied.
6. Use Inline CSS to format your resume that you created.
7. Use External CSS to format your class timetable as you created.
8. Use External, Internal, and Inline CSS to format web page of your start up.
9. Develop a JavaScript to display your admission details in the college.
10. Develop simple calculator for addition, subtraction, multiplication and division operation using JavaScript.
11. Create HTML page with JavaScript which takes integer number as input and tells whether the number is odd or even.
12. Create a login form with id and password. Perform input validation

Lab Outcomes:

The students will be able to: ·

- Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.

- Create web pages using HTML and Cascading Styles sheets

- Analyze a web page and identify its elements and attributes.

- Create web pages using XHTML and Cascading Style Sheets.

- Build dynamic web pages using JavaScript (Client side programming).

- Create XML documents and Schemas.

- Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHP, SERVLETS, JSP and protocols in the workings of the web and web applications

MAHARAJAH'S COLLEGE (AUTONOMOUS) ::VIZIANAGARAM
II Degree-LIFESKILLS COURSES

		SEMESTER III	L	T	P	C
R23	Major/ Minor	**INFORMATION AND COMMUNICATION TECHNOLOGY** (w.e.f.2023-24AdmittedBatch)	**2**	**2**	**0**	**2**
		Total Hours-30				

Course Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day today and life as well as in office and research.

SYLLABUS

UNIT-I   (08hrs)

Fundamentals of Internet: What is Internet? Internet applications, Internet Addressing– Entering a WebSite Address, URL–Components of URL, Searching the Internet, Browser

–Types of Browsers, Introduction to Social Networking: Twitter,Tumblr,LinkedIn,Facebook, flickr, Skype, yahoo, YouTube, WhatsApp.

UNIT-II   (08hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III   (10hrs)

OverviewofInternetsecurity,E-mailthreatsandsecureE-mail,Virusesandantivirussoftware, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-acharya, e-Yantra and NPTEL).

Course outcomes:

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

CO1: Understand the literature of social networks and their properties.

CO2: Explain which network is suitable for whom.

CO3: Develop skills to use various social networking sites like twitter, flickr, etc.

CO4: Learn few GOI digital initiatives in higher education.

CO5: Apply skills to use online forums, docs, spreadsheets, etc for

communication, collaboration and research.

CO6: Get acquainted with internet threats and security mechanisms.

Reference Books:

1. In-line/On-line :Fundamentals of the Internet and the World Wide Web, 2/e–by Raymond Green law and Ellen Hepp, Publishers : TMH
2. Internet technology and Web design,ISRD group, TMH.
3. Information Technology–The breaking wave, DennisP. Curtin, KimFoley, Ku naiSen and Cathleen Morin, TMH.

		SEMESTER III	L	T	P	C
R23	Major/ Minor	**Paper- INTRODUCTION TO PUBLIC ADMINISTRATION** (w.e.f.2023-24AdmittedBatch)	2	2	0	2
		Total Hours -30				

Course Objectives:

1. Understand the concept and scope and evolution of public administration.
2. Understand the relationship between public administration and public policy.
3. Develop critical thinking and analytical skills to evaluate public administration practices.

SYLLABUS

Unit: I
Introduction to public administration –Woodrow-Wilson-Definition and nature and scope of Public Administration –Significance – Distinction between public and private administration.

Unit: II
All Indian Services- Central Services –State Services – Importance of All Services UPSC&SPSCs Powers and Functions –NITI Aayog

Unit: III
Accountability of Administration in India –Legislative –Executive –Judiciary Judicial Activism –e-Governance in India –Good Governance initiatives – Functions and roles of Administrators.

Learning Outcomes:
Students at the successful completion of the course will be able to;
CO1: Awareness about the evolution and growth of the discipline of public administration.

CO2: Familiarity with the constitutional framework on which Indian Administration is based.

CO3:Understanding the in-built control mechanism over constitutional bodies and administration

in general..

Activities:
1. Class participation and discussions
2. Field trips to Government offices
3. Individual or group assignments
4. Student's projects – Individual and group
5. Quizzes or Slip tests.
6.Presentations
7. Research papers

References:
1. Public Administration by Awasthi & Maheswari
2. Indian Administration by Maheswari
3. Administration Theories by Mohit Bhattacharya
4. Comparative Administration by i Mohit Bhattacharya
5. Indian Government & Politics by B.L.Fadia

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B.Sc. DATA SCIENCE - MAJOR

	SEMESTER – IV	L	T	P	C
R23	**COURSE 9:** **DATA VISUALIZATION USING TABLEAU** **(w.e.f. 2023-24 Admitted Batch)**	**5**	**3**	**2**	**4** **(3+1)**
	Total Contact Hours - 45				

AIM AND OBJECTIVES OF COURSE:

To know the importance of data Visualization in the world of Data Analytics and

PredictionTo know the important libraries in Tableau

To get equipped with Tableau Tool

UNIT I   9hrs

Creating Visual Analytics with tableau desktop, connecting to your data-How to Connect to your data, What are generated Values? Knowing when to use a direct connection, Joining tables with tableau, blending different data sources in a single worksheet.

UNIT II   9hrs

Building your first Visualization- How Me works- Chart types, Text Tables, Maps, bar chart, Line charts, Area Fill charts and Pie charts, scatter plot, Bullet graph, Gantt charts, Sorting data in tableau,Enhancing Views with filters, sets groups and hierarchies.

UNIT III   9hrs

Creating calculations to enhance your data- What is aggregation, what are calculated values and table calculations, Using the calculation dialog box to create, Building formulas using table calculations, Using table calculation functions

UNIT IV   9hrs

Using maps to improve insights-Create a Standard Map View, Plotting your own locations on a map,Replace Tableau's standard maps, Shaping data to enable Point-to-Point mapping.

Developing an Adhoc analysis environment- generating new data with forecasts, providing self evidence adhoc analysis with parameters, Editing views in tableau Server.

COURSE OUTCOMES:

CO1: Students should be able to visualize data through seven stages of data analysis

CO2: processShould be able to do explanatory and hybrid types of data visualization

CO3: Should be able to understand various stages of visualizing data

TEXT BOOKS:

1. Tableau your data-Daniel G. Murray and the Inter works Bl team, Wiley Publications

2. Tableau Data Visualizaton Cookbook, AshutoshNandeshwar, PACKT publishing.

3. A Data Visualization Guide for BusinessProfessionals by Cole NussbaumerKnaflic (2014)

4. ggplot2: Elegant Graphics for Data Analysis by Hadley Wickham (2009)

REFERENCE BOOKS:

1. Designing Data Visualizations: Representing Informational Relationships by Noah Iliinsky, JulieSteele (2011)

2. Alexandra C. Telea - "Data Visualization principles and practice" SecondEdition, CRC Publications

3. Joshua N. Millign-" Learning Tableau -2019" -Third Edition- Packt publications

WebLinks:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

B.Sc. DATA SCIENCE – MAJOR
DATA VISUALIZATION USING TABLEAU

LIST OF PRACTICAL EXPERIMENTS

1. Connect to data Sources

2. Create Univariate Charts

3. Create Bivariate and Multivariate charts

4. Create Maps

5. Calculate user-defined fields

6. Create a workbook data extract

7. Save a workbook on a Tableau server and web

8. Export images, data.

LAB OUTCOMES:

At the end of the course, Students will be able to:

1. Use Python, R and Tableau for data visualization

2. Apply data visuals to convey trends in data over time using tableau

3. Construct effective data visualsto solve workplace problems

4. Explore and work with different plotting libraries

5. Learn and create effective visualizations

	SEMESTER – IV	**L**	**T**	**P**	**C**
R23	**COURSE 9:** **DATA VISUALIZATION USING PYTHON** (w.e.f. 2023-24 Admitted Batch)	**5**	**3**	**2**	**4** **(3+1)**
	Total Contact Hours - 45				

COURSE OBJECTIVE:

This course introduces students to data analysis and visualization in the field of exploratory data science using Python.

Unit I   **9hrs**

Introduction: Introduction to Data Science, Exploratory Data Analysis and Data Science Process. Motivation for using Python for Data Analysis, Introduction of Python Jupyter Notebook. Essential Python Libraries: NurnPy, pandas, matplotlib, SciPy, scikit-learn, stats models, seaborn.

Unit 2   **9hrs**

Getting Started with Pandas: Arrays and vectorized computation, Introduction to pandas Data Structures, Essential Functionality, Summarizing and Computing Descriptive Statistics. Data Loading, Storage and File Formats. Reading and Writing Data in Text Format

Unit 3   **9hrs**

Data Wrangling: Hierarchical Indexing, Combining and Merging Data Sets Reshaping and Pivoting. Data Visualization matplotlib: Basics of matplotlib, plotting with pandas and seaborn, other python visualization tools. Advanced categorical and numeric plots.

Unit 4   **9hrs**

Data Aggregation and Group operations: Group by Mechanics, Data aggregation, General split-apply- combine, Pivot tables and cross tabulation, Time Series Data Analysis: Date and Time Data Types and Tools, Time series Basics, date Ranges, Frequencies and Shifting, Time Zone Handling, Periods and Periods Arithmetic, Resampling and Frequency conversion, Moving Window Functions.

Unit 5   **9hrs**

Advanced Pandas: Categorical Data: cleaning data and visualization techniques, Advanced Group Bymethods, Use Techniques for Method Chaining.

COURSE LEARNING OUTCOMES:

On successful completion of the course, the students will be able to

CO1: Use data analysis tools.

CO2: The specialization tool pandas library.

CO3: Load, clean, transform, merge and reshape data.

CO4: Data cleaning and grouping operations mechanism.

CO5: Advanced pandas data frames utilization.

TEXT BOOK:

1.McKinney, W.(2017). Python for Data Analysis: Data Wrangling with Pandas, NumPy andIPython. 2nd edition. O'Reilly Media.

REFERENCE:

1. O'Neil, C., & Schutt, R. (2013). Doing Data Science: Straight Talk from the Frontline

<u>Web Links:</u>

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

LIST OF PRACTICAL EXPERIMENTS

1. Practical based on NumPy and array

2. Practical based on Pandas Data Structures

3. Practical based on Data Loading, Storage and File Formats

4. Practical based on Interacting with Web APis

5. Practical based on Data Cleaning and Preparation

6. Practical based on Data Wrangling

7. Practical based on Data Visualization using matplotlib

8. Practical based on Data Aggregation

9. Practical based on Time Series Data Analysis

Lab Outcomes:

At the end of the course the student will be able to:

CO 1. Demonstrate the use of IDLE or PyCharm IDE to create Python Applications

CO 2. Use Python programming constructs to develop programs for solving real-
world problems CO 3. Use Matplotlib for drawing different Plots

CO 4. Demonstrate working with Seaborn, Bokeh for visualization.

CO 5. Use Plotly for drawing Time Series and Maps

		SEMESTER - IV	L	T	P	C
R23		**COURSE 9: INTRODUCTION TO SQL & ADVANCED TABLEAU** (w.e.f. 2023-24 Admitted Batch)	**5**	**3**	**2**	**4** (3+1)
		Total Contact Hours - 45				

LEARNING OBJECTIVES:

▪ Design a database using DBMS software.

▪ Perform SQL queries on database.

▪ Use Tableau's visualization tools to conduct data analysis, especially exploration of an unfamiliar dataset.

UNIT I   9hrs

Overview of Database Management System: Introduction to data, information, database, database management system, DBMS software's, keys in DBMS. the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables,

UNIT 2   9hrs

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Data Manipulation Language, database constraints, Aggregate functions, Join Operation, Set Operations, Views. SQL queries, sub queries and corelated queries,

UNIT 3   9hrs

Optimal visualization types - bar chart, pie chart, gantt chart, bubble chart, bullet chart, scatter plot, line chart, heat map, tree map Maps- geographical locational plotting, Binning values , Calculated fields , Table calculations , Level of Detail calculations.

UNIT 4   9hrs

Dashboard development, Dashboard design principles, dashboard interactivity, Connected "drill-down" dashboards Best Practices, Creating visualizations with Tableau.

UNIT 5   9hrs

Advanced Tableau, Large datasets, Fiscal Year Calculations , Parameters, tableau scripting, tableau

server, integration of tableau with R programming.

COURSE OUTCOMES:

CO1: Design a database by their own and perform simple and adhoc queries.

CO2: Employ best practices in data visualization to develop charts, maps, tables, and other visual representations of data.

CO3: Utilize advanced Tableau features including parameters, data blending, custom SQL, very large data

TEXTBOOKS:

1. Show me the Numbers: Designing Tables and Graphs to Enlighten by Stephen Few

REFERENCE BOOKS:

1. The Big Book of Dashboards: Visualizing your Data using Real-World Business Scenarios by Steve Wexler, Jeffrey Shaffer, and Andy Cot greave

Web Links:

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B.Sc. DATA SCIENCE – MAJOR
LIST OF PRACTICAL EXPERIMENTS

Consider the following databases convert entities and relationships to relation table for a given scenario.

1. COLLEGE DATABASE:

   STUDENT (stno, Sname, Address, Phone, Gender)

   COURSE(9oursed, Sem, Sec)

   CLASS (stno, 9oursed)

   SUBJECT (Subcode, Title, Sem, Credits)

   MARKS (stno, Subcode, 9oursed, Testl, Test2, Test3, total)

2. COMPANYDATABASE:

   EMPLOYEE (SSN, Name, Address, Sex, Salary, SuperSSN, Dno)

   DEPARTMENT (Dno, Dname, MgrSSN, MgrStartDate)

   DLOCATION (Dno,Dloc)

   PROJECT (Pno, Pname, Plocation, Dno)

   WORKS_ON (SSN, Pno, Hours)

3. Consider a college database schema

   a. Create above tables with relevant Primary Key, Foreign Key and otherconstraints

   b. Populate the tables with data

4. Perform queries to generate outputs:

   a. Display all the details of all employees working in the company.

   b. Display ssn, lname, fname, address of employees who work indepartment no 7.

   c. Retrieve the Birthdate and Address of the employee whose name is'Franklin T.Wong'

   d. Retrieve the name and salary of every employee.

5. Perform the following queries

    a. Retrieve the names of all employees who do not have supervisors

    b. Retrieve SSN and department name for all employees

    c. Retrieve the name and address of all employees who work for the 'Research' department

R 23	SEMESTER-IV	L	P	T	C
	INDIAN PHILOSOPHY	2	---	---	2
	TOTAL CONTACT HOURS – 30				

Learning Objectives:

1. The student should understand and appreciate the diverse philosophical theories of ancient India.

2. The student should develop rational perspectives on pertinent questions of the world and human life, as viewed by ancient thinkers.

3. The student should comprehend the intellectual heritage and

legacy of free thinking in India.

SYLLABUS

Unit-I   10hrs

Introduction to Philosophy – Metaphysics, Epistemology and Ethics - Indian Philosophical

Tradition – Vedas – Philosophical Speculations of Upanishads – Darsanas – Orthodox and Unorthodox Systems of Philosophy – Metaphysical Diversity – Overview.

Unit –II   10hrs

Indian Epistemology – Knowledge – Sources of Knowledge (Pramanas) – Perception

(Pratyaksha) – Inference (Anumana) – Sabda (Testimony) – Other Pramanas – Theories of Error – Nyaya Philosophy

Unit –III   10hrs

Ethics – Morality and Ethics – Significance of Ethics in Indian Philosophy - Rita – Hedonism of Materialists - Dharma – Karma – Moksha - Ethics of Renunciation – Nirvana – Pamcha Vratas – Purusharthas - Duties of a Student - Varna and Asrama - Ethics of Bhagavad-Gita – Nishkama Karma – Sthithaprajna

Course Outcomes:

On successful completion of the course, the student

CO1: Understands what Philosophy is and its significance in human life.

CO2: Gains knowledge of Indian philosophical tradition and intellectual heritage.

CO3: Develops a critical understanding of philosophical theories of ancient systems.

CO4: Examines the rational character of Indian theories of knowledge.

CO5: Appreciates the ethical insights of ancient thinkers.

Activities:

Group Discussions

Debates

Assignments

Essay Writing

PPT Presentation

Charts/Poster presentation

Reference Books:

- An Introduction to Indian Philosophy by Satishchandra Chatterjee and DM Dutta, Motilal Banarsidass Publishers, 2016

- The Essentials of Indian philosophy by M. Hiriyanna, Motilal Banarsidass Publishers, 1995

- A Source Book in Indian Philosophy by Dr. Sarvepalli Radhakrishnan, Princeton

University Press, 2014

- A History of Indian Philosophy by Surendranath Dasgupta, the University of California, 1922

- A Critical Survey of Indian Philosophy by Chandradhar Sarma, Motilal Banarsidass

Publishers, 2000.

- The Six Ways of Knowing by D. M. Datta, Open Source, 1960

MAHARAJAH'S COLLEGE(AUTONOMOUS)::VIZIANAGARAM

II B.Sc. Computer Science Major LIFE
SKILLS COURSES

		SEMESTER IV	L	T	P	C
R23	**SEC**	**SC4-1-CYBER SECURITY** (w.e.f.2023-24AdmittedBatch)	**2**	**-**	**-**	**2**
		Total Hours – 30				

UNIT– I   8 hrs

Introduction to Cybercrime: Introduction, Cybercrime: Definition and origins of the word, Cybercrime and Information Security, who are cyber criminals? Classifications of cybercrimes, cybercrime: the legal perspectives, an Indian perspective, cybercrime and the Indian IT Act 2000, a Global perspective on Cybercrimes.

UNIT– II   12 hrs

Cybercrime-Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends inMobility, Credit Card Frauds in MobileandWirelessComputing Era, Authentication Service Security, Attacks on Mobile/Cell Phones.

Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT– III   10hrs

Tools and Methods Used in Cybercrime: Password Cracking, key loggers and Spywares, virus and worms, Trojan Horses and Backdoors, Steganography, attacks onwireless networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft).

Course Outcomes:

Upon successful completion of the course ,the students will be able to

   CO1: Developanunderstandingofcybercrimesandvariouslegalperspectivesinvolved.

   CO2: Develop a security model to handle mobile, wireless devices and related security issues
           of an organization.

   CO3: Use the cybercrime tools and methods in solving real world problems

Text Books:

1. MarkRhodes, Ousley, InformationSecurity,1stEdition,MGH,2013.

2. Nina Godbole and SunitBelpure ⁻ Cyber Security Understanding Cyber Crimes, Computer Forensics and LegalPerspectives, 1stEditionPublicationWiley, 2011.

Activities to be planned:

1. Identify a user of internet, label him as a cyber criminal or not.

2. Checklist for reporting cyber crime at Cybercrime PoliceStation.

3. Checklist for reporting cybercrime online.

4. Reporting phishing emails.

5. Demonstration of email phishing attack and preventive measures.

6. Checklist for secure netbanking.

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

Programme: B.Sc. Honors Data Science (Major)

w.e.f. AY 2023-24

		L	T	P	C
R23	**SEMESTER-V**	5	3	2	**4 (3+1)**
	COURSE 12: SUPERVISED ML WITH PYTHON (w.e.f. 2023-24 Admitted Batch)				
	Total Hours - 45				

AIM AND OBJECTIVES OF COURSE:

- The purpose of this course is to serve as an introduction to Supervised machine learning with Python.
- We will explore several classifications, regression algorithms and see how they can help usperform a variety of Supervised machine learning tasks.

UNIT I   9hrs

Machine Learning Basics: What is machine learning? Key terminology, Key tasks of machine learning, How to choose right algorithm, steps in developing a machine learning, why python?Getting started with Numpy library Classifying with k- Nearest Neighbors: The k-Nearest Neighbors classification algorithm, Parsing and importing data from a text file, Creating scatter plots with Matplotlib, Normalizing numeric values

UNIT II   9hrs

Splitting datasets one feature at a time-Decision trees: Introducing decision trees, measuring consistency in a dataset, using recursion to construct a decision tree, plotting trees in Matplotlib

UNIT III   9hrs

Classifying with probability theory-Naïve Bayes: Using probability distributions for classification, learning the naïve Bayes classifier, Parsing data from RSS feeds, using naïve Bayes to reveal regional attitudes

UNIT IV   9hrs

Logistic regression: Classification with logistic regression and the sigmoid function, Using optimization to find the best regression coefficients, the gradient descent optimization algorithm,

Dealing with missing values in the our data

<div align="center">

UNIT V   **9hrs**

</div>

Support vector machines: Introducing support vector machines, using the SMO algorithm for optimization, using kernels to "transform" data, Comparing support vector machines with other classifiers

Course outcomes:

CO1: Able to understand introduction to machine learning concepts.

CO2: Able to Loading datasets, build models and model persistence.

CO3: Understand Feature extraction from data sets.

CO4: Able to do Regression & Classification.

CO5: Able to compare SVM with other classifiers.

TEXT BOOK:

1. Machine learning in action, Peter Harrington by Manning publicationsSupervised ML with   Python Lab

Web Links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

B.Sc. DATA SCIENCE - MAJOR

LIST OF PRACTICAL EXPERIMENTS

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a CSV file. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
2. Write a program to demonstrate the working of the decision tree based ID3 algorithm.
3. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a CSV file.
4. Assuming a set of documents that need to be classified, use the naïve BayesianClassifier modelto perform this task. Built-in Java classes/API can be used towrite the program. Calculate the accuracy, precision, and recall for your dataset.

Lab Outcomes:

Learn to build and evaluate models for classification and regression tasks, using techniques like data preprocessing, model training, hyper parameter tuning, and performance evaluation metrics.

	SEMESTER - V	L	T	P	C
R23	**COURSE 13: UNSUPERVISED ML WITH PYTHON** (w.e.f. 2023-24 Admitted Batch)	5	3	2	**4** (3+1)
	Total Contact Hours – 45				

Aim and objectives of Course (Unsupervised ML with Python):

- Unsupervised Machine Learning involves finding patterns in datasets.
- The core of this course involves study of Clustering, feature extractionand optimization algorithms.
- The purpose of this course is to serve as an introduction to machine learning with Python.

UNIT I   9hrs

Unsupervised Learning: Clustering: k-means clustering algorithm, Improving clusterperformance with post processing, Bisecting k-means, Example: clustering points on a map

UNIT II   9hrs

Association analysis : Apriori algorithm: Association analysis, The Apriori principle, Finding frequent item sets with the Apriori algorithm, Mining association rules from frequent item sets, uncovering patterns in congressional voting

UNIT III   9hrs

Finding frequent item sets: FP-growth –FP trees, Build FP-tree, mining frequent from an FP- tree, finding co-occurring words in a Twitter feed, mining a click stream from a news site.

UNIT IV   9hrs

Principal component analysis: Dimensionality reduction techniques, using PCA to reduce the dimensionality of semiconductor manufacturing data

UNIT V   9hrs

Singular value decomposition: Applications of the SVD, Matrix factorization, SVD in Python, Collaborative filtering–based recommendation engines, a restaurant dishrecommendation engine

Course outcomes :

CO1: Able to do Clustering, feature extraction and optimization.

CO2: Students will be able to understand and implement in Python algorithms of Unsupervised

CO3:Machine Learning and apply them to real-world datasets.

Syllabus: (Total Hours: 90 including Teaching, Lab and internal exams, etc.)

TEXT BOOK:

1. Machine learning in action, Peter Harrington by Manning publicationsUnsupervised MLwith Python Lab

Web Links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

COURSE 13: UNSUPERVISED ML WITH PYTHON

LIST OF PRACTICAL EXPERIMENTS

1. Implementation of K-Means Clustering

2. Implement the bisecting k-means clustering algorithm

3. Implement Apriori algorithm

4. Implement Association rule-generation functions

5. Implement FP-tree creation

6. Write a function to find all paths ending with a given item.

7. Implement Code to access the Twitter Python library

8. Implement the PCA algorithm

9. Write a program to find Rating estimation by using the SVD

10. Implement Image-compression functions using SVD.

Lab Outcomes:

- Explore techniques like clustering (grouping similar data points) and dimensionality reduction (reducing data complexity) on unlabeled datasets, aiming to discover patterns and insights.

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM
III B.Sc.(HONS), V SEMESTER – END EXAMINATIONS, 2023 – 2024
Data Science REVISED SYLLABUS w.e.f.2023-24
(COURSE 13: UNSUPERVISED ML with Python)

Time: 2 1/2 Hrs   MODEL PAPER   Max. Marks: 60

SECTION – A

1. Answer any Five of the following questions: [5 X 2 = 10 M]

a. What is the role of post-processing in clustering analysis?

b. Difference between confidence and lift in association rule mining?

c. Explain purpose of pruning in the Apriori algorithm.

d. What is the advantage of using FP-Growth over Apriori for large datasets?

e. How to find co-occurring words in a **Twitter feed**?

f. Explain covariance matrix in PCA.

g. Write Applications of the SVD.

h. Define SVD.

SECTION – B

Answer the following questions: [5 X 10 = 50 M]

2. a) Explain about K-means Clustering algorithm with an example.

(OR)

b) Define Clustering? Write about Bisecting K-means algorithm steps with an example?

3. a) Explain the Apriori Algorithm with a detailed step-by-step explanation with an example.

(OR)

b) Explain the process of mining association rules from frequent itemsets by using key metrics.

4. a) Describe the process of building an FP-tree and how it is used to mine frequent itemsets.

(OR)

b) Explain the FP-Growth algorithm. How does it differ from the Apriori algorithm in terms of efficiency and approach?

5. a) Explain the role of PCA technique for dimensionality reduction.

(OR)

b) How can Principal Component Analysis (PCA) be applied to reduce the dimensionality of semi conductor manufacturing data?

6. a) What is Matrix Factorization ? Explain the role of matrix factorization in building a collaborative filtering recommendation engine.

(OR)

b) Explain the process of building a restaurant dish recommendation system using SVD-based collaborative filtering.

R23	SEMESTER – V	L	T	P	C
	COURSE 14 B: PREDICTIVE AND ADVANCED ANALYTICS USING R (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Contact Hours - 45				

Course Objectives:-

- To learn, how to develop models to predict categorical and continuous outcomes, using such techniques as neural networks, decision trees, logistic regression, support vector machines and Bayesian network models.

- To know the use of the binary classifier and numeric predictor nodes to automate model selection.

- To advice on when and how to use each model. Also learn how to combine two or more models to improve prediction

<div align="center">Unit-I</div> <div align="right">9hrs</div>

Introduction to Data Mining Introduction, what is Data Mining? Concepts of Data mining, Technologies Used, Data Mining Process, KDD Process Model, CRISP – DM, Mining on various kinds of data, Applications of Data Mining, Challenges of Data Mining.

<div align="center">Unit II</div> <div align="right">9hrs</div>

Data Understanding and Preparation Introduction, Reading data from various sources, Data visualization, Distributions and summary statistics, Relationships among variables, Extent of Missing Data. Segmentation, Outlier detection

<div align="center">Unit III</div> <div align="right">9hrs</div>

Model development & techniques Data Partitioning, Model selection, Model Development Techniques, Neural networks, Decision trees, Logistic regression, Discriminant analysis, Support vector machine, Bayesian Networks, Linear Regression, Cox Regression, Association rules.

<div align="center">Unit IV</div> <div align="right">9hrs</div>

Automated Data Preparation, Combining data files, Aggregate Data, Duplicate Removal, Sampling DATA, Data Caching, Partitioning data, Missing Values. Model Evaluation and Deployment Introduction, Model Validation, Rule Induction Using CHAID

Automating Models for Categorical and Continuous targets, Comparing and Combining Models, Evaluation Charts for Model Comparison, Deploying Model, Assessing, Model Performance, Updating a Model.

Learning outcomes of Course (In consonance with the Bloom's Taxonomy): The studentswill be able to:

- Understand the process of formulating business objectives, data selection/collection, preparation and process to successfully design, build, evaluate and implement predictive models for a various business application.
- Compare the underlying predictive modeling techniques.
- Select appropriate predictive modeling approaches to identify cases to progress with.
- Apply predictive modeling approaches using a suitable package such as SPSSModeler

Recommended Text Book:

1. Predictive & Advanced Analytics (IBM ICE Publication)
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman , The Elements of Statistical Learning-Data Mining, Inference, and Prediction ,Second Edition , Springer Verlag,2009.

Web Links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

Course Outcomes : PREDICTIVE AND ADVANCED ANALYTICS USING R

CO-PO-PSO MAPPING															
CO NO.	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PSO 01	PSO 02	PSO 03	PSO 04	PSO 05	PSO 06
CO1	✓	✓	✓	✓							✓	✓		✓	✓	
CO2			✓	✓			✓						✓			
CO3						✓			✓				✓			
CO4										✓						✓

SEMESTER-V

COURSE 14 B: PREDICTIVE AND ADVANCED ANALYTICS USING R

LIST OF PRACTICAL EXPERIMENTS

Implementation of following methods using R or Matlab

1. Simple and multiple linear regression

2. Logistic regression

3. Linear discriminant analysis

4. Ridge regression

5. Cross-validation and boot strap

6. Fitting classification and regression trees

7. K-nearest neighbors

8. Principal component analysis

9. K-means clustering

MAHARAJAH'S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM
III B.SC. Data Science Major
SEMESTER V – END EXAMINATION
(W.e.f. 2023-24 Admitted Batch)
MODEL QUESTION PAPER (Major)
(C14B-PREDICTIVE AND ADVANCED ANALYTICS USING R)

TIME: 2 ½ hr   **Max.Marks:60**

I. ANSWER ANY 3 QUESTIONS FROM THE FOLLOWING: 5 x2 =10 M

a. Discuss the various **applications of data mining.**

b. Describe the process of reading data from various sources.

c. Why is handling **missing data** important?

d. Describe the process of reading data from various sources.

e. Name two common techniques used for model development.

f. What is Cox Regression

g. Define Data Aggregation.

h. Give an example of a model suited for a categorical target.

II. ANSWER THE FOLLOWINGQUESTIONS: 5x10 =50 M

2. (a) Explain the Data Mining Process? How does the Knowledge Discovery in Databases (KDD) process model fit into it?

<div align="center">(OR)</div>

  (b) What is the CRISP-DM methodology? Discuss its phases and their significance in data mining projects.

3. (a) Explain the role of data visualization and Summary Statics. Illustrate with examples.

<div align="center">(OR)</div>

  (b) What is segmentation in data preparation? Describe its methods and applications with examples.

4. (a) Explain the working of Neural Networks and their role in model development.

<div align="center">(OR)</div>

  (b) What are Bayesian Networks? Discuss their structure and applications.

5. (a) What is Data aggregation, and how does it simplify data analysis?

<div align="center">(OR)</div>

  (b) Explain the CHAID Algorithm. How is it used for rule induction in decision-making?

6. (a) How are models compared and combined for better performance? Illustrate with examples.

<div align="center">(OR)</div>

  (b) Briefly explain about evaluation charts are used for comparing models?

	SEMESTER – V	L	T	P	C
R23	**COURSE 15 A:** **ADVANCED DATA ANALYSIS USING PYTHON** **(w.e.f. 2023-24 Admitted Batch)**	5	3	2	**4** **(3+1)**
	Total Contact Hours - 45				

UNIT I   9hrs

INTRODUCTION-Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.

UNIT II   9hrs

DATA COLLECTION AND PRE-PROCESSING-Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – DataIntegration and Transformation – Data Reduction – Data Discretization.

UNIT III   9hrs

EXPLORATORY DATA ANALYTICS-Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots –PivotTable – Heat Map – Correlation Statistics – ANOVA.

UNIT IV   9hrs

MODEL DEVELOPMENT-Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.

UNIT V   9hrs

MODEL EVALUATION-Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Over fitting –Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.

Course outcomes:

This course will enable the student to:

CO1: Present an overview data science and applications.

CO2: Plan the methods of data collection.

CO3: Describe the statistical methods in EDA.

CO4: Apply statistical methods to develop and evaluate the models.

CO5: Becoming an expert in decision making for complex projects.

Text Books:

1. Jojo Moolayil, "Smarter Decisions: The Intersection of IoT and Data Science", PACKT,2016.

2. Cathy O'Neil and Rachel Schutt , "Doing Data Science", O'Reilly, 2015.

3. David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC2013

4. Raj, Pethuru, "Handbook of Research on Cloud Infrastructures for Big Data Analytics",IGIGlobal.

Web Links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

Course Outcomes : ADVANCED DATA ANALYSIS USING PYTHON

CO-PO-PSO MAPPING																
CO NO.	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PSO 01	PSO 02	PSO 03	PSO 04	PSO 05	PSO 06
CO1	✓						✓			✓	✓			✓		
CO2	✓		✓	✓			✓			✓	✓			✓		
CO3	✓			✓			✓			✓	✓			✓		
CO4	✓			✓			✓			✓	✓	✓		✓	✓	
CO5	✓		✓	✓			✓			✓	✓	✓	✓	✓	✓	✓

COURSE 15 A: ADVANCED DATA ANALYSIS USING PYTHON

LIST OF PRACTICAL EXPERIMENTS

1. Creating a Data Frame and Matrix-like Operations on a Data Frame, Merging two Data Frames

2. Applying functions to Data Frames, import of external data in various file formats, statistical functions, compilation of data.

3. Using Functions with Factors

4. Accessing the Internet

5. Visualization Effects

6. Plotting with Layers

7. Overriding Aesthetics

8. Histograms and Density Charts

9. Simple Linear Regression – Fitting, Evaluation and Visualization

10. Multiple Linear Regression, Lasso and Ridge Regression

11. Use the following scenarios:

12. Use the Diabetes data set from UCI and Pima Indians Diabetes data set for performing the following:

    a. Univariate Analysis: Frequency, Mean, Median, Mode, Variance, Standard Deviation, Skewness and Kurtosis.

    i. Bivariate Analysis: Linear and logistic regression modeling.

    ii. Multiple Regression Analysis

    iii. Also Compare the results of the above analysis for the two data sets.

    b. Data Modelling

    i. Apply Bayesian and SVM techniques on Iris and Diabetes data set.

    ii. Apply and explore various plotting functions on UCI datasets.

Lab Outcomes:

- Experience in using Python libraries like Pandas, NumPy, and Matplotlib for data manipulation, analysis, and visualization, culminating in the ability to tackle real-world data analysis challenges.

R23	SEMESTER – VII	L	T	P	C
	COURSE 16 B: BIG DATA SECURITY (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Contact Hours - 45				

Course Objectives:

With the data generated from electronic devices growing exponentially, the need to analysed data on a large scale is important. Such data are of many types like financial, personal etc. Bigdata environment also created significant security challenges. When trying to make quick decisions. Data breach poses many complications. This course aims at introducing concepts related to big data security.

SYLLABUS

Unit-I   9hrs

BIG DATA PRIVACY, ETHICS AND SECURITY: Privacy- Re identification ofAnonymous people –

Why Big Data Privacy is self regulating? – Ethics – Ownership

–Ethical Guidelines - Big Data Security – Organizational Security.

Unit-II   9hrs

SECUTIY, COMPLIANCE, AUDITING, AND PROTECTION: Steps to secure

Big data – Classifying Data – Protecting – Big Data Compliance – IntellectualConfiguration..

Unit-III   9hrs

HADOOP SECURITY DESIGN: Kerberos – Default Hadoop Model Without securityHadoop Kerberos

Security Implementation & Configuration.

Unit-IV   9hrs

HADOOP ECOSYSTEM SECURITY: Configuring Kerberos for Hadoop ecosystemcomponents – Pig.

Hive. Oozie, Flume, HBase, Scoop.

Unit-V   9hrs

HADOOP ECOSYSTEM SECURITY: Integrating Hadoop with Enterprise SecuritySystems-Securing Sensitive

Data in Hadoop – SIEM System – Setting up audit logging in hadoop cluster.

Learning Outcomes:

1. Understanding significance of privacy, ethics in big data environment.

2. Analyzing the steps to secure big data.

3. Analyzing data security and event logging.

WebLinks:
www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

SEMESTER-VII

COURSE 16 B: BIG DATA SECURITY

<u>LIST OF PRACTICAL EXPERIMENTS</u>

1. Learn the basics of Mongo DB.

2. Installation steps for Mongo DB.

3. Use the following commands

(a) DATABASE_NAME.

(b) Drop Database( )

(c) create Collection

(d) insert( )

(e) drop( )

(f) find( )

4. Differentiate between SQL and Mongo DB.

5. Write a program to update a collection in Mongo DB

6. Write a program to remove specific document from Mongo DB.

7. Write a program to implement aggregate function in Mongo DB.

8. Apply the Map reduce operation to find total salary of each departmentassumingemployee collection is already exists.

R23	**SEMESTER – VII**	**L**	**T**	**P**	**C**
	COURSE 17 A: INTRODUCTION TO DEEP LEARNING **(w.e.f. 2023-24 Admitted Batch)**	**5**	**3**	**2**	**4** **(3+1)**
	Total Contact Hours - 45				

Course Objectives:

1. To introduce basics of linear algebra and probability theory
2. To introduce the fundamental techniques and principles of Neural Networks
3. To familiarize different models in Artificial Neural Networks (ANN) and their applications
4. To familiarize deep learning concepts with Convolutional Neural Network case studies
5. To explain functioning of deep neural networks

SYLLABUS

Unit 1   9hrs

Linear Algebra and Probability Theory: Linear Algebra :Scalars, Vectors, Matrices and Tensors, Multiplying Matrices and Vectors, Identity and Inverse Matrices Calculus: Derivatives and Differentiation, Partial Derivatives, Gradients Probability Theory : Basic Probability Theory, Dealing with Multiple Random Variables, Expectation and Variance.

Unit 2   9hrs

Fundamentals of Neural Networks: Introduction to Neural Network, Model of Artificial Neuron, Learning rules and various activation functions.

Unit 3   9hrs

Neural Network Architecture: Single layer Feed-forward networks. Multi-layer Feed-forward networks. Recurrent Networks.

Unit 4   9hrs

Back propagation Networks: Back Propagation networks, Architecture of Back-propagation (BP) Networks, Backpropagation Learning, Variation of Standard Back propagation algorithms.

Unit 5   9hrs

Deep Neural Networks: Introduction to Deep Neural Networks, training deep models, TrainingDeep Neural Networks using Back Propagation-Setup and initialization issues, Gradient- Descent Strategies, vanishing and exploding Gradient problems, regularizations, dropouts.

Course Outcomes:

After learning the course, the students will be able to:

1. Discuss feed forward networks and their training issues
2. Distinguish different types of ANN architectures
3. Design Feed Forward Neural Network architecture for research problems
4. Apply mathematical concepts such as linear algebra, calculus to solve the researchproblems.
5. Apply deep learning techniques to practical problems
6. Evaluate model performance and interpret results

Text Books:

1. S.Rajasekaran and G.A. Vijayalakshmi Pai, "Neural Networks,Fuzzy Logic and

GeneticAlgorithms", PHI Learning Pvt. Ltd., 2003, ISBN:978-81-203-2186-1.

2. Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola, "Dive into DeepLearning",

Amazon Science, 2021.

Reference Books:

1. Jacek M. Zurada,"Introduction to artificial neural systems", West Publishing Co., 1992,ISBN: 0-3 14-

93391 -

2. Goodfellow I., BengioY., and Courville A., "Deep Learning", MIT Press, 2016, ISBN:978-

0262035613.

3. Bishop C. M., "Pattern Recognition and Machine Learning", Springer, 2006, ISBN:978-0-387-

31073-2.

Web Links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

COURSE 17 A: INTRODUCTION TO DEEP LEARNING

LIST OF PRACTICAL EXPERIMENTS

1. Design and implement a CNN for Image Classification:

   a) Select a suitable image classification dataset (medical imaging, agricultural,etc.).

   b) Optimized with different hyper-parameters including learning rate, filter size,no. oflayers, optimizers, dropouts, etc.

2. Apply a pre-trained network and apply it to a new task using transfer learning

   a) Use any three pre-trained models including AlexNet, GoogleNet, VGGNet,MobileNet,ResNet, DenseNet, etc.

   b) Fine-tune the hyper-parameters and compare their performance for a suitable application.

3. Design RNN or its variant including LSTM or GRU

   a) Select a suitable time series dataset. Example – predict sentiments based on product reviews

   b) Apply for prediction

4. build a word2vec model for unstructured data a) Use any unstructured textdataset

   a) Convert words into a representative vector of numerical values5.Implement an

   artificialneural network on GPUs

   b) Implement ANN on GPUs.

R23	SEMESTER – VII	L	T	P	C
	COURSE 18 B: DATA & INFORMATION SECURITY	5	3	2	4 (3+1)
	(w.e.f. 2023-24 Admitted Batch)				
	Total Contact Hours - 45				

SYLLABUS

UNIT-I   9HRS

Overview of Security: Protection versus security; aspects of security – data integrity, dataavailability, privacy; security problems, user authentication, Orange Book.

UNIT -II   9HRS

Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and bufferoverflow; system threats- intrudes; communication threats- tapping and piracy.

UNIT –III   9HRS

Cryptography: Substitution, transposition ciphers, symmetric-key algorithms – Data Encryption Standard, advanced encryption standards, public key encryption – RSA; Diffie Hellman key exchange, ECC cryptography, Message Authentication – MAC, hasfunctions.

UNIT –IV   9HRS

Digital Signatures: Symmetric key signatures, public key signatures, message digests,publickey infrastructures.

UNIT –V   9HRS

Security Mechanism: Intrusion detection, auditing and logging, tripwire, system –callmonitoring.

Text Books:

1. W. Stallings, Cryptography and Network Security Principles and Practices (4th ed.,),Prentice – Hall of India, 2006.
2. C. Pfleeger and SL Pfleeger, Security in Computing (3rd ed.,), Prentice- Hall of India,2007.

Reference Books:

1. D. Gollamann, Computer Security, John Wiley and Sons, Ny, 2002.
2. J. Piwprzyk, T. Hardjono and J. Seberry, Fundamentals of Computer Security,
3. Springer- Verlag Berling, 2003.
4. J.M. Kizza, Computer Netwrok Security, Springer, 2007
5. M. Merkow and J. Breithaupt, Information Security: Principles and Practices, Pearson
6. Education, 2006.

Web Links:
www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

COURSE 18 B: DATA & INFORMATION SECURITY

<u>LIST OF PRACTICAL EXPERIMENTS</u>

1. Implement Ceiser Cipher encryption in Python.

2. Implement Ceiser Cipher decryption in Python.

3. Implement Transposition technique encryption in Python.

4. Implement Substitution cipher encryption in Python.

5. Implement Substitution cipher decryption in Python.

6. Implement One time Pad cipher in Python.

7. Implement DES encryption in Python.

8. Implement RSA Public Key encryption in Python

	SEMESTER – VII	L	T	P	C
R23	**COURSE 19: INTRODUCTION TO NEURAL NETWORKS** **(w.e.f. 2023-24 Admitted Batch)**	5	3	2	**4** **(3+1)**
	Total Contact Hours - 45				

Learning Objectives:

1. The main objective of Neural Network Techniques to Improve Data Analysis Solutions is to strengthen the dialogue between the statistics and soft computing research communities in order to cross-pollinate both fields and generate mutual improvement activities.

2. Also introduce the neural networks for classification, regression and to give design methodologies for artificial neural networks.

UNIT 1   9HRS

Introduction to Artificial Intelligence System: Neural Network, Fuzzy logic, Genetic Algorithm. Fundamentals of Neural Networks: What is Neural Network, Model of Artificial Neuron, Learning rules and various activation functions.

UNIT 2   9HRS

Neural Network Architecture: Single layer Feed-forward networks. Multilayer Feed-forward networks. Recurrent Networks. Back propagation Networks: Back Propagation networks, Architecture of Back-propagation(BP) Networks, Back-propagation Learning, Variation of Standard Back propagation algorithms.

UNIT 3   9HRS

Introduction about Fuzzy set theory: Fuzzy versus Crisp, Crisp and fuzzy sets, Crisp and Fuzzy relations. Fuzzy Systems: Crisp Logic, Predicate Logic, Fuzzy logic, Fuzzy rule based system, Defuzzification Methods, Applications.

UNIT 4   9HRS

Integration of Neural Network, Fuzzy logic and Genetic Algorithm: Hybrid system. Neural Networks, Fuzzy logic, and Genetic Algorithm Hybrids.

Associative Memory: Autocorrelators, Heterocorrelators, Wang et al's Multiple Training Encoding Strategy, Exponential BAM, Associative Memory for Real coded pattern pairs, Applications.

Learning Outcome:

On successful completion of this course, student will be able to

1. Obtain the fundamentals and types of neural networks. The student will have a broadknowledge in developing the different algorithms for neural networks.
2. Analyze neural controllers
3. Have a broad knowledge in Fuzzy logic principles and will be able to determine differentmethods of Deffuzification

Text book:

1. Neural Networks a Comprehensive Foundations, Simon S Haykin, PHI Ed.,.
2. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing HouseEd.2006.
3. Neural Networks in Computer Inteligance, Li Min Fu TMH 2003 Neuro-FuzzySystems,Chin Teng Lin, C. S. George Lee, PHI.
4. Build_Neural_Network_With_MS_Excel_sample by Joe choong.

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SEMESTER-VII

COURSE 19: INTRODUCTION TO NEURAL NETWORKS

<u>LIST OF PRACTICAL EXPERIMENTS</u>

1. Create a perceptron with appropriate no. of inputs and outputs. Train it using fixedincrement learning algorithm until no change in weights is required. Output the finalweights.

2 Create a simple ADALINE network with appropriate no. of input and output nodes.Train it using delta learning rule until no change in weights is required. Output the final weights.

3 Train the auto correlator by given patterns: A1=(-1,1,-1,1), A2=(1,1,1,-1), A3=(-1, -1, -1,1). Test it using patterns: Ax=(-1,1,-1,1), Ay=(1,1,1,1), Az=(-1,-1,-1,-1).

4. To Implement Convolution Neural network for Text classification or ImageClassification

5. Implementation of Naïve Bayes/SVM/SGD/SVM classifier on text and image

6. To study Word Embedding techniques : Word2vec,doc2vec,Glove

7. Implement Linear/Logistic regression.

	SEMESTER - VII	L	T	P	C
R23	**COURSE 20: NATURAL LANGUAGE PROCESSING** (w.e.f. 2023-24 Admitted Batch)	5	3	2	**4** **(3+1)**
	Total Contact Hours - 45				

COURSE OBJECTIVE:

The basic objectives of natural language processing course are the following:

1. Learn the basics of natural language processing and understand varioussteps in it.
2. To introduce the fundamentals of language processing from thealgorithmic viewpoint.
3. To discuss various issues that make natural language processing a hardtask.
4. To discuss some well-known applications of natural language processing

UNIT I   9hrs

INTRODUCTION :Natural Language Processing tasks in syntax, semantics, and pragmatics – Issues – Applications – The role of machine learning – Probability Basics

–Information theory – Collocations -N-gram Language Models – Estimating parametersandsmoothing – Evaluating language models.

UNIT II   9hrs

WORD LEVEL AND SYNTACTIC ANALYSIS :Word Level Analysis: Regular Expressions-Finite-State Automata-Morphological Parsing-Spelling Error Detection and correction-Wordsand Word classes-Part-of Speech Tagging. Syntactic Analysis: Context free Grammar- Constituency- Parsing-Probabilistic Parsing.

UNIT III   9hrs

SEMANTIC ANALYSIS AND DISCOURSE PROCESSING :Semantic Analysis: Meaning Representation-Lexical Semantics- Ambiguity-Word Sense Disambiguation. Discourse Processing: cohesion-Reference Resolution- Discourse Coherence and Structure.

UNIT IV   **9hrs**

NATURAL LANGUAGE GENERATION AND MACHINE TRANSLATION : Natural
Language Generation: Architecture of NLG Systems- Generation Tasks and Representations Application
of NLG. Machine Translation: Problems in Machine Translation- Characteristics of Indian Languages-
Machine Translation Approaches-Translation involving Indian Languages.

UNIT V   **9hrs**

INFORMATION RETRIEVAL AND LEXICAL RESOURCES:Information Retrieval:
Design features of Information Retrieval Systems-Classical, Non-classical, Alternative Models of
Information Retrieval – valuation Lexical Resources: WorldNet-Frame Net Stemmers-POS Tagger-
Research Corpora

LEARNING OUTCOME:

At the end of the course, the student should be able to:

1. Appreciate the fundamental concepts of natural language processing.

2. Design algorithms for natural language processing tasks.

3. Develop useful systems for language processing and related tasksinvolving text processing.

Text Books:

1.Natural Language Processing with Python. Steven Bird, Ewan Klein, and Edward Lope,O'Reily, 2009

2.Natural Language Processing Recipes: Unlocking Text Data with Machine Learningand   Deep
 Learning using Python. Akshay Kulkarni,Adarsha Shivananda, Apress, 2019 Suggested Reading:

References Books:

3. Allen James, Natural Language Understanding, Benjamin/Cumming,1995.

4. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.

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COURSE 20: NATURAL LANGUAGE PROCESSING
LIST OF PRACTICAL EXPERIMENTS

1. Text segmentation: Segment a text into linguistically meaningful units, such as paragraphs, sentences, or words. Write programs to segment text (in different formats) intotokens (words and word-like units) using regular expressions. Compare an automatic tokenization with a gold standard

2. Part-of-speech tagging: Label words (tokens) with parts of speech such as noun, adjective, and verb using a variety of tagging methods, e.g., default tagger, regularexpression tagger, unigram tagger, and n-gram taggers.

3. Text classification: Categorize text documents into predefined classes using Naïve BayesClassifier and the Perceptron model

4. Chunk extraction, or partial parsing: Extract short phrases from a part-of-speech taggedsentence. This is different from full parsing in that we're interested in standalone chunks, or phrases, instead of full parse trees

5. Parsing: parsing specific kinds of data, focusing primarily on dates, times, and HTML.Make use of the following preprocessing libraries:

- dateutil which provides datetime parsing and timezone conversion
- lxml and BeautifulSoup which can parse, clean, and convert HTML
- charade and UnicodeDammit which can detect and convert text character encoding

6. Sentiment Analysis: Using Libraries TextBlob and nltk, give the sentiment of a document

R23	SEMESTER - VIII	L	T	P	C
	COURSE 21 B: COMPUTATIONAL DATA SCIENCE **(w.e.f. 2023-24 Admitted Batch)**	5	3	2	**4** **(3+1)**
	Total Contact Hours - 45				

Aim and objectives of Course (Predictive and Advanced Analytics):

The course enables students to:

1. To learn descriptive statistics using computational tools
2. To learn distributions in probability.
3. To work with different types of dispersion measures.

UNIT I   9hrs

Data Science Computational Tools - Statistical Techniques -Plotting the Classics - LiteraryCharac-ters - Causality and Experiments - Tables -Randomness - Conditional Statements - Iteration - Simulation .

UNIT II   9hrs

Finding Probabilities - Sampling and Empirical Distributions - Empirical Distributions - Sampling from a Population - Empirical Distribution of a Statistic - Testing Hypotheses -Assessing Models - Multiple Categories - Decisions and Uncertainty - Error Probabilities.

UNIT III   9hrs

Comparing Two Samples - A/B Testing –Deflategate - Causality - Estimation – ImportanceofMean-Properties of the Mean - Variability - The SD and the Normal Curve.

UNIT IV   9hrs

The Central Limit Theorem - The Variability of the Sample Mean - Choosing a Sample Size -Predic-tion - Correlation - The Regression Line - The Method of Least Squares - Least SquaresRegression

UNIT V   9hrs

Visual Diagnostics -Numerical Diagnostics. Inference for Regression - A Regression Model -Inference for the True Slope - Prediction Intervals

Learning outcomes of Course (In consonance with the Bloom's Taxonomy):

The students willbe able to:

- To understand different computational tools and statistical techniques.
- To learn about curve fitting in data science.
- Able to perform visual diagnostics.

TEXT BOOK:

1. Ani Adhikari and John DeNero, David Wagner "Computational and Inferential Thinking: TheFoundations of Data Science", 2019.
2. Web link: https://inferentialthinking.com/chapters/intro.html

REFERENCES:

1. The Art of Data Science: A Guide for Anyone Who Works with Data, Roger D. Peng,andEliz-abeth Matsui, ISBN: 9781365061462, 2018.
2. The Big Book of Dashboards: Visualizing Your Data Using Real-World Business Scenarios.by Steve Wexler, Jeffrey Shaffer, Andy Cotgreave, ISBN: 1119282713,2017

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<center>SEMESTER-VIII</center>

<center>**COURSE 21 B: COMPUTATIONAL DATA SCIENCE**</center>

<center>**<u>LIST OF PRACTICAL EXPERIMENTS</u>**</center>

1. Project Gutenberg is a website that publishes public domain books online. Using Python,loadthe text of two classic novels directly from the web.

2. Create a Table, add new columns, add data, move data to a table using cvs file, access thedatain a column and choose sets of columns.

3. Perform scatter Plots and Line Graphs using Python(https://inferentialthinking.com/chapters/07/Visualization.html)

4. Write a Program that simulates Multiple values

5. Based on the top_movies_2017.csv data set,draw some samples, create a deterministicsample,find probability sample and find systematic

sample.(https://inferentialthinking.com/chapters/10/Sampling_and_Empirical_Distributions.html)

6. Simulate one value, multiple value of the statistic and visualise the results in an empirical historram circuits.(https://inferentialthinking.com/chapters/11/1/Assessing_a_Model.html)

7. Under A/B Testing, observed difference, Predict the static under null hypothesis, and performpermutations test.

8. Using Central Limit theorem, find out the average flight delay from the database 'united_summer2015.csv.'

R23	SEMESTER - VIII	L	T	P	C
	COURSE 22 A: COMPUTER VISION WITH PYTHON (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Contact Hours - 45				

SYLLABUS

UNIT – 1   9Hrs

(Image Formation and Processing) Image formation and Image model- Componentsof a vision system- Cameras- camera model and camera calibration-Radiometry- Light in space- Light insurface - Sources, shadows and shading. Fundamentals of Image processing: Basic steps of Image processing system sampling and quantization of an Image – Basic relationship between pixels.

UNIT – 2   9 Hrs

(Feature Extraction) Points and Patches – Feature detectors,feature descriptors, feature matching, feature tracking. Edges – edgedetection, edge linking. Lines - Successiveapproximation, Hough transforms, Vanishing points.

UNIT – 3   9 Hrs

(Image Segmentation) Classification of segmentation techniques, Edge detection, Edge linking, Thresholding, Region growing, Region splitting and merging, Watershed based segmentation. Shadow detection and removal. Image processing using OpenCV - blending, smoothing, and reshaping.

UNIT – 4   9 Hrs

(Image Recognition and Classification) Shape based object classification, Motion based object classification, Viola Jones Object Detection Framework, Object classification using CNNs, use of RCNN for object classification.

UNIT – 5   9 Hrs

(Applications) Speech and Handwriting Recognition, Automatic Face Recognition, Video Segmentation and KeyframeExtraction, Real-Time Hand Pose Recognition.

Course Outcomes:

This course enables the learners to understand the advancedconcepts in computer vision. The course

covers the basics of image processing, imaginggeometry, image segmentation,

feature extraction, object recognition and classification and common applications ofcomputervision.

This course helps the students to design solutions for complexreal-life problems.

Text Books:

1. David A. Forsyth & Jean Ponce, Computer vision – A Modern Approach, PrenticeHall, 2002.

2. Richard Szeliski, Computer Vision: Algorithms and Applications, Springer.

3. Maheshkumar H Kolekar, "Intelligent Video Surveillance Systems: An AlgorithmicApproach", CRC Press. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

4. Francesco Camastra, Alessandro Vinciarelli, "Machine Learning for Audio, Imageand Video Analysis: Theory and Applications", Springer 2015.

Reference Books

1. Reinhard Klette, "Concise Computer Vision: An Introduction intoTheory and Algorithms", Springer London, 2014.

2. Olivier Faugeras, "Three-Dimensional Computer Vision", The MITPress, 1993.

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COURSE 22 A: COMPUTER VISION WITH PYTHON

LIST OF PRACTICAL EXPERIMENTS

1. Reducing the Number of Intensity Levels in an Image.

2. Zooming and Shrinking Images by Pixel Replication.

3. Zooming and Shrinking Images by Bilinear Interpolation.

4. Arithmetic Operations.

5. Image Enhancement Using Intensity Transformations.

6. Histogram Equalization.

7. Spatial Filtering.

8. Enhancement Using the Laplacian.

9. Unsharp Masking

R23	SEMESTER – VIII	L	T	P	C
	COURSE 23 A: SOCIAL MEDIA ANALYTICS (w.e.f. 2023-24 Admitted Batch)	5	3	2	**4** **(3+1)**
	Total Contact Hours - 45				

COURSE OBJECTIVES:

- To Understand the Complete Architecture of Social MediaAnalytics
- To know Web analytics tools
- To know the social media of ongoing campaigns

UNIT-I   9Hrs

Introduction to Social Media Analytics (SMA): Social media landscape, Need for SMA; SMA in Small organizations; SMA in large organizations; Application of SMA in different areas Network fundamentals and models: The social networks perspective - nodes, ties and influencers, Social network and web data and methods.

UNIT-II   9Hrs

Graphs and Matrices- Basic measures for individuals and networks. Information visualizationMaking connections: Link analysis. Random graphs and network evolution. Social contexts:Affiliation and identity. Web analytics tools and techniques: Click steam analysis, A/B testing,online surveys.

UNIT-III   9Hrs

Web crawling and Indexing; Natural Language Processing Techniques for Micro-text Analysis Facebook Analytics: Introduction, parameters, demographics. Analyzing pageaudience. Reachand Engagement analysis.

UNIT-IV   9Hrs

Processing and Visualizing Data, Influence Maximization, Link Prediction, Collective Classification. Applications in Advertising and Game Analytics (Use of tools like Unity30 / PyCharm).Introduction to Python Programming, Collecting and analyzing social media data; visualization and exploration

UNIT-V   9Hrs

Social campaigns. Measuring and Analyzing social campaigns, defining goals and evaluating outcomes, Network Analysis. (LinkedIn, Instagram, YouTube Twitter etc.) Use of Google Analytics. Post Performance on FB, Use of Facebook Business Manager

COURSE OUTCOMES

- Students will get well knowledge of what is Social Media AnalyticsKnowledge in Webanalytics tools
- Mapping of Network Analysis. (LinkedIn, Instagram, YouTube Twitter etc.)

Text Books:

1. Mathew Ganis, Avinash Koihrkar Social Media Analytics IBM Press 2015 / 1st

2. Jim SterneSocial Media Metrics Wiley Latest

3. Oliver Blanchard Social Media ROI QuePublishing Latest

4. Marshall Sponder, Gorah F. KhanDigital Analytics for Marketing Routledge 2017 / 1st

Reference books:

1. Marshall Sponder Social Media Analytics McGraw Hill Latest

2. Tracy L. Tuten, Michael R. Solomon Social Media Marketing Sage 2018 / 3rd

3. Gohar F.Khan Creating Value With Social MediaAnalytics Create Space Independent Publishing 2018 1st

4. Alex Gonsalves Social Media Analytics Strategy Appress 2017 / 1st

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COURSE 23 A: SOCIAL MEDIA ANALYTICS

LIST OF PRACTICAL EXPERIMENTS

Using Python Implement the following Programs

1. Managing text data

2. Syntactical analysis

3. Vector semantics and latent semantic analysis (LSA)

4. Clustering and topic modeling:PLSA, LDA, SLDA, ...

5. Text classification: naive Bayesian, maximum entropy, SVM, ...

6. Clustering Physician Reviews

7. Discovering Topics on Twitter

8. Deep Learning with Text

9. Students should analyses the social media of any ongoing campaigns and present the findings.

	SEMESTER - VIII	L	T	P	C
R23	COURSE 24: BUSINESS INTELLIGENCE AND VISUALIZATION (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Contact Hours - 45				

COURSE OBJECTIVES:

The student should be made to be familiar with the Business intelligence architectures mostfundamental Graphs and results.

Be exposed to the techniques of proofs and analysis.

Detailed Syllabus: (Five units with each unit having 12 hours of class work)

SYLLABUS

UNIT-I   9hrs

BUSINESS INTELLIGENCE: Effective and timely decisions - Data, information, and knowledge - Role of mathematical models - Business intelligence architectures: Cycle of abusiness intelligence analysis - Enabling factors in business intelligence projects

UNIT-II   9hrs

KNOWLEDGE DELIVERY: The business intelligence user types. Standard reports. Interactive Analysis. and Ad Hoc Querying, Parameterized Reports: and self-Service Reporting,dimensional analysis Analysis/notifications, Visualizations: Charts, Graphs,Widgets, Scorecards, and Dashboard.

UNIT- III   9hrs

EFFICIENCY: Efficiency measures -The CCR model: Definition of target objectives- peer groups - Identification of good operating practices; cross-efficiency analysis - virtual inputsandoutputs - Other models. Pattern matching -cluster analysis, outlier analysis

UNIT-IV   9hrs

BUSINESS INTELLIGENCE APPLICATIONS: Marketing model- Logistic and Productionmodels

-Case studies. Development of a business intelligence system -Ethics and business intelligence.Geographic Visualization, Integrated Analytics, Considerations: Optimizing the Presentation for the Right Message.

UNIT- V   9hrs

FUTU RE OF BUSINESS INTELLIGENCE: Future of business intelligence - Emerging Technologies, Machine Learning, Predicting the Future, BI Search & Text Analytics - Advanced Visualization -Rich Report, Future beyond Technology.

TEXT BOOK:
I. Efraim Turban, Ramesh Sharda, Dursun Deleo, "Decision Support and Business

   IntelligenceSystems". 9th Edition, Pearson 20 13.

REFERENCES:

I. Larissa T. Moss, S. Acre, "Business Intelligence Roadmap: The CompleteProject Lifecycle of Decision Making", Addison Wesley,2003.

2. Carlo Vercellis, "Business Intelligence: Data Mining and Optimization for DecisionMaking ", Wiley

Publications,2009.

3. David Loshin Morgan, Kaufman. "Business Intelligence: The Savvy ManagersGuide", Second Edition,20 12.

4. Cindi Howson, "Successful Business Intelligence: Secret< to Making Bl " KillerApp".McGraw-

Hill,2007.

s. Ralph Kimball, Margy Ross, Warren Thornthwaite, Joy Mundy, Bob Becker, "TheDataWarehouse Lifecycle Toolkit", Wiley publication lnc.,2007.

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COURSE 24: BUSINESS INTELLIGENCE AND VISUALIZATION

LIST OF PRACTICAL EXPERIMENTS

Practical 1: Import the legacy data from different sources such as (Excel, SqlServer, Oracleetc.)and load in the target system.

Practical 2: Perform the Extraction Transformation and Loading (ETL) process to constructthedatabase in the Sqlserver / Power BI.

Practical 3: Data Visualization from ETL Process Power BI DesktopPractical 4: Creating aCube in SQL server 2012

Practical 5: Apply the what – if Analysis for data visualization. Design and generatenecessaryreports based on the data warehouse data.

Practical 6: Implementation of Classification algorithm in R Programming.Practical 7: Practical Implementation of Decision Tree using R Tool Practical 8: k-means clustering usingR

Practical 9: Prediction Using Linear Regression Practical 10: Data Analysis using TimeSeries Analysis

Practical 11: Data Modelling and Analytics with Pivot Table in ExcelPractical 12: DataAnalysis and Visualization using Advanced Excel

	SEMESTER - VIII	L	T	P	C
R23	**COURSE 25: DATA VISUALIZATION USING JAVASCRIPT** **w.e.f. 2023-24 Admitted Batch)**	**5**	**3**	**2**	**4** **(3+1)**
	Total Contact Hours - 45				