

(P.G. DEPARTMENT OF COMPUTER SCIENCE)

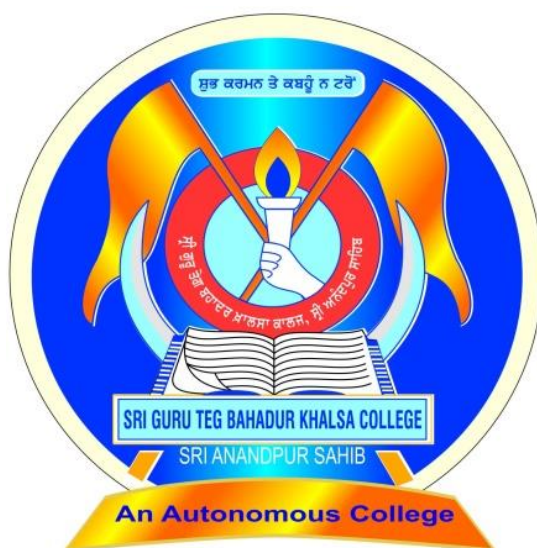
**OUTLINES OF TESTS,
SYLLABI AND COURSES OF READING**

FOR

**B.SC.(HONS.) IN ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
(SEMESTER SYSTEM)**

**SECOND YEAR (Semester III & IV)
(2021-22, 2022-23 and 2023-24 Sessions)**

FACULTY OF COMPUTING SCIENCES



SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib

An Autonomous College

Affiliated to Punjabi University, Patiala

APPROVED

Board of Studies Meeting held on 19th June 2021

**SYLLABI, OUTLINES OF PAPERS AND TESTS FOR
B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
Second Year - Third Semester Examinations
For Session 2021-22, 2022-23, 2023-24**

CODE NO.	TITLE OF THE PAPER	Schedule of Teaching (Hrs/Week)			TOTAL HOURS	CREDITS	MARKS	
		L	T	P			Internal	External
BSCHAI-131	Mathematical Foundation Course	5	1	0	6	6	30	70
BSCHAI-132	Problem Solving and Programming in Python	4	0	0	4	4	30	70
BSCHAI-133	Fundamentals of DBMS	4	0	0	4	4	30	70
BSCHAI-134	Open Elective –III*	5	1	0	6	6	30	70
BSCHAI-135	Software Lab-IV (Based on BSCHAI-132)	0	0	4	4	2	30	70
BSCHAI-136	Software Lab-V (Based on BSCHAI-133)	0	0	4	4	2	30	70
BSP-301A,B	Punjabi Compulsory OR Punjabi MudhlaGyan	4	0	0	4	4	30	70
	Total	22	2	8	32	28	210	490

Open Elective –III* (Choose any one among below)

BSCHAI-134 (i) Communication Skills

BSCHAI-134(ii) Theory of Computation

BSCHAI-134(iii) Intellectual Property Rights Awareness.

Note:

1. The break up of marks for the practical will be as under:

- | | |
|--|----------|
| i. Internal Assessment | 30 Marks |
| ii. Viva Voce (External Evaluation) | 30 Marks |
| iii. Lab Record Program Development and Execution(External Evaluation) | 40 Marks |

2. The breakup of marks for the internal assessment for theory Subjects will be as under:

- | | |
|------------------------|----------|
| Mid semester test – I | 10 Marks |
| Mid semester test – II | 10 Marks |
| Attendance | 5 Marks |
| Assignment | 5 Marks |

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SYLLABI, OUTLINES OF PAPERS AND TESTS FOR
B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
Second Year - Fourth Semester Examinations
For Session 2021-22, 2022-23, 2023-24

CODE NO.	TITLE OF THE PAPER	Schedule of Teaching (Hrs/Week)			TOTAL HOURS	CREDITS	MARKS	
		L	T	P			Internal	External
BSCHAI-141	Probability and Statistics in Data Science	5	1	0	6	6	30	70
BSCHAI-142	Data Analysis using Python	4	0	0	4	4	30	70
BSCHAI-143	Web Technology	4	0	0	4	4	30	70
BSCHAI-144	Open Elective-IV	5	1	0	6	6	30	70
BSCHAI-145	Programming Lab-V (Based on BSCHAI-142)	0	0	4	4	2	30	70
BSCHAI-146	Software Lab-I (Based on BSCHAI-143)	0	0	4	4	2	30	70
	Total	18	2	8	28	24	180	420

Open Elective –IV* (Choose any one amongst below)

BSCHAI-144(i) Software Engineering

BSCHAI-144(ii) Cyber Security and Information Assurance

BSCHAI-144(iii) Social Networking and Mining

Note:

1. The break up of marks for the practical will be as under:

- | | |
|--|----------|
| i. Internal Assessment | 30 Marks |
| ii. Viva Voce (External Evaluation) | 30 Marks |
| iii. Lab Record Program Development and Execution(External Evaluation) | 40 Marks |

2. The breakup of marks for the internal assessment for theory Subjects will be as under:

- | | |
|------------------------|----------|
| Mid semester test – I | 10 Marks |
| Mid semester test – II | 10 Marks |
| Attendance | 5 Marks |
| Assignment | 5 Marks |

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BSCHAI –131 Mathematical Foundation Course

Time Allowed: 3 Hours
Number of Lecture per Week: 6
Pass Percentage: 35%
Credits: 6 (5L+1T)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To introduce the concept of Matrices and Determinants.
- ii. To have basic understanding of Number Systems and Complex Numbers.
- iii. To learn about the Cartesian System of Rectangular Co-ordinates.

SECTION A

Matrices: Types of Matrices, Addition, Subtraction, Multiplication, Transpose, Conjugate and their properties, Symmetric, Skew-symmetric, Minor, co-factors, Adjoint, Inverse of matrices, Solution of linear system of equations using matrices.

Determinants: Expansion of determinants, solution of linear system of equations using Cramer rule.

Basic Number System: Floating point representation of numbers, arithmetic operation with normalised floating point numbers and its consequences, errors in numbers.

Solution of transcendental equations (without convergence): Bi-section method, Regula-falsi method, Newton/Raphson method, Secant method

Solution of simultaneous algebraic equations: Gauss elimination method, pivoting, ill-conditioned equations, Gauss-Seidel iterative method, comparison of direct and iterative method.

SECTION B

Complex Numbers: Complex Numbers in the form of $a+ib$, Real and Imaginary parts of a complex number, Complex conjugate, algebra of complex numbers, square roots of a complex number, cube roots of unity.

Quadratic Equations: Solutions of Quadratic equations (with real and complex coefficients), Relations between roots and coefficients, Nature of roots, Equations reducible to quadratic equations.

Cartesian System of Rectangular Coordinates: Cartesian coordinate system, distance formula, section formula, centroid and incentre, area of triangle, condition for collinearities of three points in a plane.

Course Learning Outcomes: At the end of this course, students will be able to:

- i. Solve different Number System problems.
- ii. Understand the concept of Quadratic Equations and how to solve them.
- iii. Find solutions for Cartesian System of Rectangular Co-ordinates.

Reference Books:

1. NCERT Textbooks of Mathematics for +1 and +2.

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2. M K. Jain, S.R.K. Iyengar and R.K. Jain,” Numerical Methods for Scientific and Engineering Computation”, Wiley.
3. B. S. Grewal, Higher Engineering Mathematics”, Khanna Publishers.

BSCHAI – 132 Problem Solving and Programming in Python

Time Allowed: 3 Hours

Max. Marks: 100

Number of Lecture per Week: 4

External Marks: 70

Pass Percentage: 35%

Internal Assessment: 30

Credits: 4(4L)

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To learn and understand Python programming basics and paradigm.
- ii. To learn and understand Python looping, control statements and string manipulations.
- iii. To write simple Python programs for solving problems.
- iv. To learn how to decompose a Python program into functions, lists etc.

Section A

Basics of Python: History, Features, Strength and Weakness, Different Versions, Working with Python, Basic Syntax, indentation; keywords, identifiers, assignment statements, expressions, Variable and Data Types, Data Types Conversion, Printing on screen, Reading data from keyboard.

Operators: Arithmetic, Comparison, Assignment, Bitwise, Logical, Membership, Identity, Operators Precedence,

Conditional Statements: If, If- else, Nested if-else

Looping: For, While, Nested loops, Break and continue statements.

Lists: Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Tuple: Introduction, Accessing tuples, Operations, Working Functions and Methods.

Dictionaries: Introduction, Accessing values in dictionaries, Working with dictionaries, Properties.

Python Functions: Function introduction, Types of functions, Functions with parameters, Keywords and optional parameters, Scope of variables (Global and Local), Anonymous function – Lambda, In-build function, List comprehension.

Section B

String Manipulation: Accessing Strings, len, min, max functions, indexing, slicing, concatenation, in / not in operator, comparing strings. Substring search and split functions.

Formatting: the format() method, arguments- format field names. Formatting numbers and strings: rounding, precision, scientific notation, percentage, width and justify.

Python Modules: Modules, Standard Modules (Math, Sys module), Import Statement, from statement, Dir() functions.

OOPs concepts in Python- Class and object, Encapsulation, Data Abstraction, Inheritance, Polymorphism; Creating and accessing objects attributes and methods, Python Constructors, Python Inheritance- multiple and multilevel, overriding and overloading.

Course Learning Outcomes: At the end of this course, students will be able to:

- i. To define and demonstrate the use of built-in data structures lists, tuples and dictionary.

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- ii. To design and implement a program to solve a real world problem.
- iii. To learn how to build and package Python modules for reusability.
- iv. To learn how to design object-oriented programs with Python classes.
- v. To learn different file handling methods.

Text Books:

1. Paul Gries, Jennifer Campbell, Jason Montojo, Practical Programming- An Introduction to Computer Science Using Python 3.6, Shroff Publications and Distributors.

Reference books:

1. John V Guttag, Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press.
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd.
3. Timothy A. Budd, Exploring Python, Mc-Graw Hill Education (India) Private Ltd.
4. Paul Gries, Jennifer Campbell and Jason Montojo, Practical Programming: An Introduction to Computer Science using Python 3, Second edition, Pragmatic Programmers, LLC.
5. Rossum, Introduction To Python ,Shroff Publications and Distributors.
6. Downey,Think Python 2/ED, Shroff Publications and Distributors.
7. Lutz, Learning Python, 5/ED, Shroff Publications and Distributors.
8. Campbell ,Practical Programming: An Introduction to Computer Science Using Python, Shroff Publications and Distributors.

BSCHAI – 133 Fundamentals of DBMS

Time Allowed: 3 Hours
Number of Lecture per Week: 4
Pass Percentage: 35%
CREDITS: 4(4L)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To explain basic database concepts, applications, data models, schemas and instances.
- ii. To demonstrate the use of constraints and relational algebra operations.
- iii. Describe the basics of SQL and construct queries using SQL.
- iv. To emphasize the importance of normalization in databases.
- v. To facilitate students in Database design.
- vi. To familiarize issues of concurrency control and transaction management.

Section A

Introduction: Database Approach, Characteristics of a Database Approach, Database System Environment. Roles in Database Environment: Database Administrators, Database Designers, End Users, Application Developers.

Database Management Systems: Definition, Characteristics, Advantages of Using DBMS Approach, Classification of DBMSs.

Architecture: Data Models, Categories of Data Models- Conceptual Data Models, Physical data Models, Representational Data Models, such as, Object Based Models, Record Based Models, Database Schema and Instance, Three Schema Architecture, Data Independence – Physical and Logical data Independence.

Database Conceptual Modelling by E-R model: Concepts, Entities and Entity Sets, Attributes, Mapping Constraints, E-R Diagram, Weak Entity Sets, Strong Entity Sets.

Enhanced E-R Modelling: Aggregation, Generalization, Converting ER Diagrams to Tables.

Relational Data Model: Concepts and Terminology, Characteristics of Relations.

Constraints: Integrity Constraints- Entity and Referential Integrity constraints, Keys- Super Keys, Candidate Keys, Primary Keys, Secondary Keys and Foreign Keys.

Database languages: DDL, DML, DCL.

SECTION-B

Database Design: Informal Design Guidelines for Relation Schemas, Problems of Bad Database Design,

Normalization: Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive Dependency, Normal Forms– 1NF, 2NF, 3NF, Boyce-Codd NF,

Transaction & Concurrency Control: Concept of transaction, ACID properties, Serializability, States of transaction, Concurrency Control – Locking techniques, time-stamp based protocols.

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Database Security: Security requirements, database integrity, Granting & revoking privileges.

Course Learning Outcomes: At the end of this course, students will be able to:

- i. Describe the fundamental elements of relational database management systems.
- ii. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
- iii. Design ER-models to represent simple database application scenarios.
- iv. Populate and query a database using SQL DML/DDL commands.

Text Books:

1. Elmisry Navathe, Introduction to Database Systems, Pearson Education India.
2. Content Development Group” Working with MS-OFFICE 2000 “, TMH.

Reference Books:

1. Henry F. Korth, Abraham, Database System Concepts, Tata McGraw Hill.
2. Naveen Prakash, Introduction to Database Management”, TMH.
3. C.J. Date, An Introduction to Data Base Systems, Pearson Education India.

BSCHAI – 134 (i) Communication Skills

6CREDITS: 5H(L)+1H(T)

Max. Marks: 100

External Examination: 70

Internal Assessment: 30

Time Allowed: 3 Hours

CREDITS: 6(5L+1T)

Pass Marks: 35%

External Examination: 25

Internal Assessment: 11

Total Lectures: 90

Objective of the Syllabus:

The prescribed text helps the students increase their proficiency in English by enhancing their resources to deal with communicative needs of everyday life.

INSTRUCTIONS FOR PAPER SETTER

- The Question paper will consist of four sections-A, B, C & D.
- Section A will carry 20 marks, Section B will carry 10 marks, Section C will carry 10 marks, & Section D will carry 30 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt all questions from all four sections-A, B, C & D

Texts Prescribed for Grammar and Vocabulary:

Prose Parable – (1-10 chapters)

W. Stannard Allen: Living English Structure (Orient Longman)

SECTION A

Q.1 (a) One essay type question with internal alternative on the theme, incident and character from *Prose Parables*. The answer should not exceed 250 words. 10 marks

(b) 5 short answer type questions to be attempted out of the given eight from *Prose Parables* (40-50 words) 5×2 = 10 marks

SECTION B – COMPREHENSION

Q. 2 One unseen passage for comprehension with five questions from the passage of five marks, and 05 marks for vocabulary such as word formation and inferring meaning.

10 marks

SECTION C – GRAMMAR

- Q.3** (a) Transcoding: Prose to dialogue. (One passage will be given) 5 marks
(b) Error correction in sentences.(Attempt 5 out of 8 sentences) 2.5 marks
(c) Drafting questions based on given inputs 2.5 marks

SECTION D – COMPOSITION

Q.4 (a) Writing one out of two official letters from the given topics:

1. Making inquiries
2. Suggesting changes
3. Registering complaints
4. Asking and giving information 10 marks

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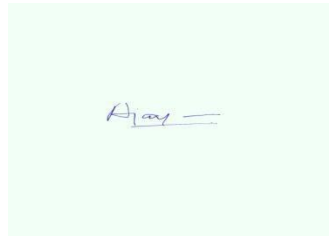
Board of Studies Meeting held on 19th June 2021

(b) Development of a story from given hints

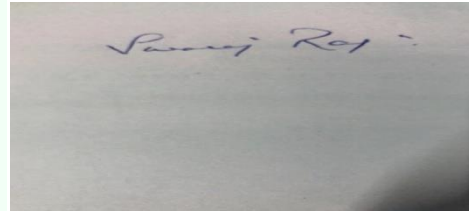
10 marks

(c) Application for job including CV/Resume

10 marks



Dr. Ajay Verma



Dr. Swaraj Raj

Dr. Gurpreet Kaur

BSCHAI – 134 (ii) Theory of Computation

Time Allowed: 3 Hours

Max. Marks: 100

Number of Lecture per Week: 6

External Marks: 70

Pass Percentage: 35%

Internal Assessment: 30

CREDITS: 6(5L+1T)

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To give an overview of the theoretical foundations of computer science from the perspective of formal languages.
- ii. To understand the concept of machines: finite automata, pushdown automata, linear bounded automata, and Turing machines.
- iii. To understand the context-free languages and context-free grammar.
- iv. To understand the concept of Turing Machines.

Section A

Languages: Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar.

Finite Automata and Regular Languages: Regular Expressions, Transition Graphs, Deterministics and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

Section B

Context free languages: Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

Turing Machines and Models of Computations: RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, un-solvability problems.

Course Learning Outcomes: At the end of this course, students will be able:

- i. To use basic concepts of formal languages of finite automata techniques.
- ii. To design Finite Automata's for different Regular Expressions and Languages.
- iii. To construct context free grammar for various languages.
- iv. To solve various problems of applying normal form techniques, push down automata and Turing Machines.

Reference Books:

1. Daniel I.A.Cohen, Introduction to computer theory, John Wiley.

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2. Lewis & Papadimitriou, Elements of the theory of computation , PHI.
3. Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation –3rd Edition, Pearson Education.
4. P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett.

BSCHAI – 134 (iii) Intellectual Property Rights Awareness

Time Allowed: 3 Hours
Number of Lecture per Week: 6
Pass Percentage: 35%
Credits: 6(5L+1T)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- ii. To disseminate knowledge on patents, patent regime in India and abroad and registration aspects.
- iii. To disseminate knowledge on copyrights and its related rights and registration aspects.
- iv. To disseminate knowledge on trademarks and registration aspects.

Section A

Overview Of Intellectual Property: Introduction and the need for intellectual property right (IPR), IPR in India – Genesis and Development, IPR in abroad, Some important examples of IPR.

Patents: Macro economic impact of the patent system, Patent and kind of inventions protected by a patent, Patent document, How to protect your inventions?, Granting of patent, Rights of a patent, How extensive is patent protection?, Why protect inventions by patents?, Searching a patent, Drafting of a patent, Filing of a patent, The different layers of the international patent system, (national, regional and international options)

Utility models, Differences between a utility model and a patent?, Trade secrets and know-how agreements.

Copyright: Definition, Copyright Scope, Duration of Copyright, Reasons for protecting through copyright, RELATED RIGHTS: Definition, Distinction between related rights and copyright, Rights covered by copyright.

Trademarks: Definition, Rights of trademark, Kind of signs used as trademarks, Types of trademark, function does a trademark perform, Procedure for protecting trademark.

Registration Process of trademark, Duration of registered trademark, Extensiveness of trademark protection, Various well-known marks and procedure for their protection, Domain name and its relation with trademarks.

Section B

Geographical Indications: Definition, Procedure for geographical indication protection, Reasons for geographical indications protection.

Industrial Designs: Definition, Procedure for industrial design protection.

Kinds of protection provided by industrial designs, Duration, Reasons for protecting industrial designs.

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Unfair Competition: Definition, Relationship between unfair competition and intellectual property laws.

Enforcement Of Intellectual Property Rights: Infringement of intellectual property rights, Enforcement Measures

Emerging Issues In Intellectual Property: Intellectual Property Intellectual Property Rights related to I.T., Management Licensing and Enforcing Intellectual Property, Commercializing I.T. Invention, Case studies of I.T. Patents

Startups: Introduction about Startup: Schemes by Govt of India for Starting Startups, Procedure for applying for funding for opening Startups.

Incubation Centers: Introduction about Incubation Center, Schemes by Govt of India for Starting Incubation Centers, Procedure for applying for funding for Opening Incubation Centers. Various Activities by Incubation Centers.

Course Learning Outcomes:

- i. The students once they complete their academic projects shall get an adequate knowledge on patent and copyright for their innovative research works.
- ii. During their research career, information in patent documents provides useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations.
- iii. Pave the way for the students to catch up Intellectual Property (IP) as an career option
 - a. R&D IP Counsel
 - b. Government Jobs – Patent Examiner
 - c. Private Jobs
 - d. Patent agent and Trademark agent
 - e. Entrepreneur

Text Books:

1. T. M Murray and M.J. Mehlman, Encyclopedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons.

Online Course Web Link: NPTEL Web Course on Intellectual Property Rights.
<http://nptel.iitm.ac.in>

References:

1. P.N. Cheremisinoff, R.P. Ouellette and R.M. Bartholomew, Biotechnology Applications and Research, Technomic Publishing Co., Inc. USA.
2. D. Balasubramaniam, C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman, Concepts in Biotechnology, University Press (Orient Longman Ltd)
3. Bourgagaize, Jewell and Buiser, Biotechnology: Demystifying the Concepts, Wesley Longman, USA.
4. AjitParulekar and Sarita D' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India Ltd.
5. B.L.Wadehra; Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd., India.
6. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi.

BSCHAI – 135 Programming Lab-III
(Based on BSCHAI-132)

Time Allowed: 3 Hours
Number of Practical per Week: 4
Pass Percentage: 35%
CREDITS: 2(4P)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

This course will mainly comprise of exercises on the basis of the following theory paper BSCHAI-132: Problem Solving and Programming in Python.

***The splitting of marks is as under:**

Maximum Marks for Continuous Assessment: 30
Maximum Marks for University Examination: 70

BSCHAI – 136 Programming Lab-IV
(Based on BSCHAI-133)

Time Allowed: 3 Hours
Number of Practicals per Week: 4
Pass Percentage: 35%
Credits: 2(4P)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

This course will mainly comprise of exercises on the basis of the following theory paper
BSCHAI-133: Fundamentals of DBMS.

***The splitting of marks is as under:**

Maximum Marks for Continuous Assessment: 30
Maximum Marks for University Examination: 70

ਬੀ.ਐਸ.ਸੀਆਨਰਜ਼ਆਰਟੀਫਿਕੇਸ਼ਨਲਿਟੈਲੀਜੈਂਸਐਂਡਡਾਟਾਸਾਇੰਸਅਤੇਬੀ.ਐਸ.ਸੀ.(ਮੈਡੀਕਲ/ਨਾਨਮੈਡੀਕਲ)

ਭਾਗਦੂਜਾ,ਸਮੈਸਟਰਤੀਜਾ

ਪੇਪਰ-ਪੰਜਾਬੀਲਾਜ਼ਮੀ

ਪੇਪਰ ਕੋਡ:BSP-301A,ਕ੍ਰੈਡਿਟ-04

2020-21,2021-22,2022-23 ਸੈਸ਼ਨਲਈ

ਕੁੱਲਅੰਕ :100

ਬਾਹਰੀ ਪਰੀਖਿਆ:70ਅੰਕ

ਅਮਦਰੂਨੀਮੁਲਾਂਕਣ :30ਅੰਕ

ਸਮਾਂ:3 ਘੰਟੇ

ਵਿਸ਼ੇਵਿਚੋਂਪਾਸਅੰਕ : 35

ਬਾਹਰੀਪਰੀਖਿਆਵਿਚੋਂਪਾਸਅੰਕ: 25

ਅੰਦਰੂਨੀਮੁਲਾਂਕਣਵਿਚੋਂਪਾਸ ਅੰਕ:10

ਕੁੱਲ ਲੈਕਚਰ:60

ਪਾਠਕ੍ਰਮਦਾਉਦੇਸ਼:

1.ਵਿਦਿਆਰਥੀਆਂਵਿਚਸਾਹਿਤਪੜ੍ਹਨਦੀਰੁਚੀਪੈਦਾਕਰਨਾ।

2.ਮਾਤਭਾਸ਼ਾਵਿੱਚਉਚੇਰੀਸਿੱਖਿਆਗ੍ਰਹਿਣਕਰਨਦੀਜਾਗਲਾਉਣਾ।

3.ਵਿਆਕਰਨਕਪੱਖਾਨਾਲਰਾਬਤਾਕਾਇਮਕਰਵਾਉਣਾ।

4.ਵਿਦਿਆਰਥੀਆਂਨੂੰਨੈਤਿਕਕਦਰਾਂ-ਕੀਮਤਾਂਬਾਰੇਜਾਣਕਾਰੀਦੇਣਾ।

ਪੇਪਰਸੈਂਟਰਅਤੇਵਿਦਿਆਰਥੀਆਂਲਈਹਦਾਇਤਾਂ:

1.ਭਾਗ-ੳ ਵਿਚੋਂਨਾਟਕਦਾਵਿਸ਼ਾ-ਵਸਤੂ /ਸਾਰ/ ਲੇਖਕਦਾਯੋਗਦਾਨ (ਦੋ ਵਿਚੋਂਇੱਕ) 10 ਅਮਕ

2.ਭਾਗ-ੳ ਵਿਚਨਾਟਕਦੀਪਾਠ-ਪੁਸਤਕਵਿਚੋਂਪਾਤਰਾਂਦਾਚਰਿੱਤਰ-ਚਿਤਰਣ (ਪੰਜਵਿਚੋਂ ਦੋ)

5+5=10 ਅਮਕ

3.ਭਾਗ ਅ-1 ਵਿਚਨੈਤਿਕਕਦਰਾਂ-ਕੀਮਤਾਂਨਾਲਸੰਬੰਧਿਤਪੈਰੋਦਾਸਿਰਲੇਖ ਦੱਸ ਕੇਸੰਖੇਪਰਚਨਾ

(ਦੋਵਿਚੋਂਇੱਕ)2+8=10 ਅਮਕ

4.ਭਾਗ-ਅ:2 ਵਿਚੋਂਵਿਆਕਰਨਨਾਲਸੰਬੰਧਿਤਵਰਣਾਤਮਕਪ੍ਰਸ਼ਨ

(ਦੋ ਵਿਚੋਂਇੱਕ) 10 ਅਮਕ

5.ਭਾਗ-ੲ ਵਿਚਨਾਟਕਦੀਪਾਠ-ਪੁਸਤਕਅਤੇਵਿਆਕਰਨ ਵਿਚੋਂਕੁੱਲ 15(8+7)

ਸੰਖੇਪਉੱਤਰਾਂਵਾਲੇਲਾਜ਼ਮੀਪ੍ਰਸ਼ਨ। ਵਿਦਿਆਰਥੀਆਂਲਈਸਾਰੇਪ੍ਰਸ਼ਨਕਰਨੇਜ਼ਰੂਰੀਹਨ। ਹਰੇਕਪ੍ਰਸ਼ਨ 2 ਅਮਕਾਂਦਾਹੋਵੇਗਾ। (15ਯ2=30 ਅਮਕ)

ਪਾਠਕ੍ਰਮਅਤੇਪ੍ਰਸ਼ਨ-ਪੱਤਰਦੀਰੂਪ-ਰੇਖਾ

ਭਾਗ-ੳ

ੳ - ਹਿੰਦੀਚਾਦਰ (ਨਾਟਕ):ਹਰਚਰਨਸਿੰਘ,ਲਾਹੌਰਬੁੱਕਸ਼ਾਪ,ਲੁਧਿਆਣਾ

ਭਾਗ-ਅ

ਅ-1:ਨੈਤਿਕਕਦਰਾਂ-ਕੀਮਤਾਂਨਾਲਸੰਬੰਧਿਤਸੰਖੇਪਰਚਨਾ

ਅ-2: ਵਿਆਕਰਨ

(f) ਵਿਆਕਰਨਕਇਕਾਈਆਂ

5- ਉਪਵਾਕ:ਪਰਿਭਾਸ਼ਾਅਤੇਵਰਗੀਕਰਨ

5- ਉਪਵਾਕ:ਪਰਿਭਾਸ਼ਾਅਤੇਵਰਗੀਕਰਨ

ਭਾਗ-ੲ

ਨਾਟਕਦੀਪਾਠ-ਪੁਸਤਕਅਤੇਵਿਆਕਰਨਵਾਲੇਭਾਗਵਿਚੋਂਸੰਖੇਪਉੱਤਰਾਂਵਾਲੇਪ੍ਰਸ਼ਨ

ਸਹਾਇਕਪੁਸਤਕਾਂ

1.ਹਰਚਰਨਸਿੰਘ, ਨਾਟਕਕਲਾਤੇਹੋਰਲੇਖ,ਪੈਪਸੂਬੁੱਕਡਿਪੂ ,ਪਟਿਆਲਾ,1972

2.ਹਰਚਰਨਸਿੰਘ,ਪੰਜਾਬਦੀਨਾਟਪਰੰਪਰਾ,ਪੰਜਾਬੀਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,

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Board of Studies Meeting held on 19th June 2021

3. ਬਲਵੰਤਗਾਰਗੀ, ਰੰਗਮੰਚ, ਨਵਯੁਗ ਪਬਲਿਸ਼ਰਜ਼, ਦਿੱਲੀ, 1964
4. ਹਰਸਰਨਸਿੰਘ, ਥਇਟਰ, ਲੋਕਗੀਤ ਪ੍ਰਕਾਸ਼ਨ, ਚੰਡੀਗੜ੍ਹ, 1988
5. ਬੂਟਾਸਿੰਘਬਰਾੜ, ਪੰਜਾਬੀਭਾਸ਼ਾਸ਼੍ਰੋਤੋਸਰੂਪ, ਵਾਰਿਸਸ਼ਾਹਫਾਂਊਡੇਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ, 2012
6. ਬੂਟਾਸਿੰਘਬਰਾੜ, ਪੰਜਾਬੀਵਿਆਕਰਨਸਿਧਾਂਤਅਤੇਵਿਹਾਰ, ਚੇਤਨਾਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ, 2008
7. ਬਲਦੇਵਸਿੰਘਚੀਮਾ, ਪੰਜਾਬੀਵਿਆਕਰਨਤੇਭਾਸ਼ਾਵਿਗਿਆਨ, ਤਕਨੀਕੀਸ਼ਬਦਾਵਲੀਦਾਵਿਸ਼ਾਕੋਸ਼, ਪਬਲੀਕੇਸ਼ਨਬਿਊਰੋਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2009
8. ਡਾ. ਜਗਜੀਤਸਿੰਘ, ਪੰਜਾਬੀਵਿਆਕਰਨ: ਸ਼ਰੇਣੀਆਅਤੇਇਕਾਈਆ, ਨਿਊਬੁੱਕਕੰਪਨੀ, ਚੰਡੀਗੜ੍ਹ।
9. ਡਾ. ਜੋਗਿੰਦਰਸਿੰਘਪੁਆਰਾਅਤੇਹੋਰ, ਪੰਜਾਬੀਭਾਸ਼ਾਦਾਵਿਆਕਰਨਭਾਗੀ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ, 1991
10. ਗਿਆਨੀਲਾਲਸਿੰਘਤੇਹਰਕੀਰਤਸਿੰਘ, ਕਾਲਜਪੰਜਾਬੀਵਿਆਕਰਣ, ਪੰਜਾਬਸਟੇਟਯੂਨੀ.ਟੈਕਸਟ ਬੁੱਕਬੋਰਡ, ਚੰਡੀਗੜ੍ਹ
11. ਸੰਤਸਿੰਘਸੇਖੋਂ, ਸਾਹਿਤਆਰਥ, ਲਾਹੌਰਬੁੱਕਸ਼ਾਪ, ਲੁਧਿਆਣਾ

ਬੀ.ਐਸ.ਸੀਆਨਰਜ਼ਆਰਟੀਫਿਕੇਟਿੰਗਟੈਲੀਜੈਂਸਐਂਡਡਾਟਾਸਾਇੰਸਅਤੇਬੀ.ਐਸ.ਸੀ.(ਮੈਡੀਕਲ/ਨਾਨਮੈਡੀਕਲ)

ਭਾਗਦੂਜਾ ,ਸਮੈਸਟਰਤੀਜਾ

ਪੇਪਰ-ਪੰਜਾਬੀਮੁੱਢਲਾਗਿਆਨ

ਪੇਪਰ ਕੋਡ:BSP-301B,ਕ੍ਰੈਡਿਟ-04

2020-21,2021-22,2022-23ਸੈਸ਼ਨ ਲਈ

ਕੁੱਲਅੰਕ :100

ਬਾਹਰੀ ਪਰੀਖਿਆ:70 ਅੰਕ

ਅਮਦਰੂਨੀਮੁਲਾਂਕਣ :30 ਅੰਕ

ਸਮਾਂ:3 ਘੰਟੇ

ਵਿਸ਼ੇਵਿਚੋਂਪਾਸਅੰਕ : 35

ਬਾਹਰੀਪਰੀਖਿਆਵਿਚੋਂਪਾਸਅੰਕ: 25

ਅੰਦਰੂਨੀਮੁਲਾਂਕਣਵਿਚੋਂਪਾਸ ਅੰਕ:10

ਕੁੱਲ ਲੈਕਚਰ:60

ਪਾਠਕ੍ਰਮਦਾਉਦੇਸ਼:

- 1.ਵਿਦਿਆਰਥੀਆਂਵਿਚਸਾਹਿਤਪੜ੍ਹਨਦੀਰੁਚੀਪੈਦਾਕਰਨਾ।
- 2.ਵਿਦਿਆਰਥੀਆਂਨੂੰਪੰਜਾਬੀਭਾਸ਼ਾਦੀਜਾਣਕਾਰੀਦੇਣਾ।
- 3.ਵਿਦਿਆਰਥੀਆਂਨੂੰਸਹਿਤਸਿਰਜਣਲਈਪ੍ਰੇਰਿਤਕਰਨਾ।
- 4.ਵਿਦਿਆਰਥੀਆਂਨੂੰਸਭਿਆਚਾਰ,ਲੋਕਧਾਰਾਅਤੇਨੈਤਿਕਕਦਰਾਂ -ਕੀਮਤਾਂਤੋਂਜਾਣੂਕਰਵਾਉਣਾ।

ਪੇਪਰਸੈਂਟਰਅਤੇਵਿਦਿਆਰਥੀਆਂਲਈਹਦਾਇਤਾਂ:

- 1.ਸਾਰਾਪੇਪਰ‘ਅੱਖਰਗਿਆਨ (ਭਾਗ-ਦੂਜਾ)’ਪਾਠ-ਪੁਸਤਕਵਿਚੋਂਹੀਸੈਟਕੀਤਾਜਾਵੇ।
- 2.ਭਾਗ-ੳ: ਵਿਚਨਿਬੰਧਦਾਵਿਸ਼ਾ-ਵਸਤੂ /ਸਾਰ (ਤਿੰਨਵਿਚੋਂਇੱਕ)10 ਅਮਕ
- 3.ਭਾਗ-ਅ:1 ਵਿਚਅੰਗਰੇਜ਼ੀਸ਼ਬਦਾਂਤੋਂਪੰਜਾਬੀਸ਼ਬਦਾਂਵਿਚਅਨੁਵਾਦ (ਪੰਦਰਾਂਵਿਚੋਂ ਦਸ) 10 ਅਮਕ
- 4.ਭਾਗ-ਅ:2 ਵਿਚਸ਼ਬਦਾਂ -ਜੋੜਾਂਦੀਸੁਧਾਈ (ਪੰਦਰਾਂਵਿਚੋਂ ਦਸ) 10ਅਮਕ
- 5.ਭਾਗ-ਅ:3 ਵਿਚਵਿਆਕਰਨਨਾਲਸੰਬੰਧਿਤਵਰਣਾਤਮਕਪ੍ਰਸ਼ਨ (ਦੋ ਵਿਚੋਂਇੱਕ) 10 ਅਮਕ
- 6.ਭਾਗ-ੲ ਵਿਚਭਾਗ-ੳ ਅਤੇ ਅ ਦੇਸਾਰੇਸਿਲੇਬਸਵਿਚੋਂਕੁੱਲ
15ਆਬਜੈਕਟਿਵਪ੍ਰਸ਼ਨ। ਵਿਦਿਆਰਥੀਆਂਲਈਸਾਰੇਪ੍ਰਸ਼ਨਕਰਨੇਲਾਜ਼ਮੀਹਨ। ਹਰੇਕਪ੍ਰਸ਼ਨ 2 ਅਮਕਾਂਦਾਹੋਵੇਗਾ।
(15ਯ2=30 ਅਮਕ)

ਪਾਠਕ੍ਰਮਅਤੇਪ੍ਰਸ਼ਨ-ਪੱਤਰਦੀਰੂਪ-ਰੇਖਾ
ਭਾਗ-ੳ

ੳ -ਅੱਖਰਗਿਆਨ(ਭਾਗ-ਦੂਜਾ),ਮੁੱਖਸੰਪਾ.

ੲ.ਜਸਵੀਰਸਿੰਘ,ਸੰਪਾ.ਡਾ.ਅਵਤਾਰਸਿੰਘ,ਡਾ.ਗੁਰਪ੍ਰੀਤਕੌਰ,ਪ੍ਰੋ.ਸੁਖਵਿੰਦਰਸਿੰਘ,ਸ੍ਰੀਗੁਰੂਤੇਗਬਹਾਦਰ

ਖ਼ਾਲਸਾਕਾਲਜ,ਸ੍ਰੀਅਨੰਦਪੁਰਸਾਹਿਬ,ਪਬਲੀਕੇਸ਼ਨਬਿਊਰੋ,ਪੁਸਤਕਵਿੱਚੋਂਨਿਬੰਧਵਾਲਾਭਾਗ

ਭਾਗ-ਅ

ਅ-1. ਅਨੁਵਾਦ(ਅਮਗਰੇਜ਼ੀਸ਼ਬਦਾਂਤੋਂਪੰਜਾਬੀਸ਼ਬਦਾਂਵਿਚ)

ਅ-2 .ਸ਼ਬਦਜੋੜਾਂਦੀਸੁਧਾਈ।

ਅ-3 .ਵਿਸ਼ੇਸ਼ਣਅਤੇਕਿਰਿਆਵਿਸ਼ੇਸ਼ਣ :ਪਰਿਭਾਸ਼ਾਅਤੇਕਿਸਮਾਂ

ਭਾਗ-ੲ

ਭਾਗ-ੳਅਤੇ ਅ ਦੇਸਾਰੇਸਿਲੇਬਸਵਿਚੋਂਆਬਜੈਕਟਿਵਪ੍ਰਸ਼ਨ

ਸਹਾਇਕਪੁਸਤਕਾਂ

1. ਬਲਦੇਵਸਿੰਘਚੀਮਾ, ਪੰਜਾਬੀਵਿਆਕਰਨਤੇਭਾਸ਼ਾਵਿਗਿਆਨ,ਤਕਨੀਕੀਸ਼ਬਦਾਵਲੀਦਾਵਿਸ਼ਾਕੋਸ਼,ਪਬਲੀਕੇਸ਼ਨਬਿਊਰੋਪੰਜਾਬੀ
ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ,2009
2. ਡਾ.ਜੋਗਿੰਦਰਸਿੰਘਪੁਆਰਾਅਤੇਹੋਰ,ਪੰਜਾਬੀਭਾਸ਼ਾਦਾਵਿਆਕਰਨਭਾਗੀ,ਪੰਜਾਬੀਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
3. ਡਾ.ਜੋਗਿੰਦਰਸਿੰਘਪੁਆਰਾਅਤੇਹੋਰ,ਪੰਜਾਬੀਭਾਸ਼ਾਦਾਵਿਆਕਰਨਭਾਗੀ,ਪੰਜਾਬੀਭਾਸ਼ਾ ਅਕਾਦਮੀ,ਜਲੰਧਰ,1991
- 4.ਬਲਵੀਰਸਿੰਘਦਿਲ, ਪੰਜਾਬੀਨਿਬੰਧ :ਸਰੂਪ, ਸਿਧਾਂਤਅਤੇਵਿਕਾਸ,ਪਬਲੀਕੇਸ਼ਨਬਿਊਰੋ, ਪੰਜਾਬੀ,ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।
- 5.ਖੋਜ ਪੱਤ੍ਰਕਾ, ਨਿਬੰਧ ਅਮਕ-29,ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ,ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।

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Board of Studies Meeting held on 19th June 2021

SEMESTER – IV

BSCHAI – 141 Probability and Statistics in Data Science

Time Allowed: 3 Hours
Number of Lecture per Week: 6
Pass Percentage: 35%
Credits: 6(5L+1T)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To make students understand about the data collection and different measures of central tendency such as Mean, Median and Mode.
- ii. To teach the students about Correlation and Regression Analysis.
- iii. To give an introduction to Probability of occurrence of a data item from given set of data.

Section A

Collection of data, Measures of central tendency(Mean,Median,Mode) , Mean Deviation, Standard Deviation, Variance, Coefficient of Variation, Skewness, Kurtosis, Moments, Corelation(Karl Pearson Coeficient of correlation, Spearmans Rank Corelation) , Regression Analysis.

Section B

Probability: Definition, Addition theorem, Independent Events, Conditional Probability, Bayes theorem, Random Variable , Binomial Distribution, Poisson Distribution, Normal Distribution.

Sampling:- Sample , Hypothesis, Confidence Limits, Central Limit Theorem, Population, Universe, t-test, F-test, Chi- Square test, Anova.

Course Learning Outcomes: At the end of this course, students will be able to:

- i. Apply different methods to find Correlation such as Karl Pearson's Method and Spearmans Rank Correlation.
- ii. Understand Conditional Probability and apply Bayes Theorem for the Classification of data.
- iii. Understand the concept of Sampling and different terms associated with it.

Text Books:-

1. Statistical Methods , SP Gupta , Sultan Chand and Sons.
2. Higher Engineering Mathematics , BS Grewal , Khanna Publishers.
3. A Text Book for Statistics , Goon and Gupta.

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Board of Studies Meeting held on 19th June 2021

BSCHAI – 142 Data Analysis using Python

Time Allowed: 3 Hours

Max. Marks: 100

Number of Lecture per Week: 4

External Marks: 70

Pass Percentage: 35%

Internal Assessment: 30

Credits: 4(4L)

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To install and use Jupyter notebooks.
- ii. To demonstrate the basic concepts of Numpy and its various functions.
- iii. To introduce Pandas Series and DataFrames.
- iv. To introduce data manipulation and cleaning techniques using Pandas.
- v. To demonstrate the loading of various formats and various data manipulation operations like data wrangling, group operations etc.
- vi. To introduce data visualization and plotting tools.

Section A

Introduction to Data Analysis: Kinds of Data, Essential Python Libraries:NumPy, Pandas, Matplotlib, IPython and Jupyter, SciPy, scikit-learn, statsmodels

Introduction to IPython, and Jupyter Notebooks: The Python Interpreter.

Python Language Basics: built-in data structures and functions.

NumPy Basics:The NumPyndarray: Creating ndarrays, Data types for ndarraays, Arithmetic with NumPy Arrays, Basic indexing, slicing, Boolean indexing,Fancy indexing, transposing arrays and swapping axes, Universal Functions: Fast Element-Wise Array Functions,Array-Oriented Programming with Arrays, Broadcasting

Getting Started With Pandas: Introduction to pandas Data Structures: Series, Dataframe, Index Objects

Essential Functionality: Reindexing, Dropping Entries from an Axis, Indexing, Selection, Filtering, Integer Indexes, Arithmetic and Data Alignment, Function Application and Mapping, Sorting and Ranking, Axis Indexes with Duplicate Labels, Summarizing and Computing Descriptive Statistics.

Section B

Data Loading, Storage, and File Formats: Reading and Writing Data in Text Format: csv files, Reading and Writing Excel files.

Data Cleaning and Preparation: Handling Missing Data:filtering out missing data, filling in missing data ; Data Transformation: Removing duplicates, transforming data using a function or mapping, replacing values, renaming axis indexes, String Manipulation: string object methods.

Data Wrangling: Join, Combine, and Reshape, Hierarchical Indexing, Combining and Merging Datasets, Reshaping with hierarchical indexing.

Data Aggregation and Group Operations: GroupByMechanics, Iterating over groups, selecting a column or subset of columns, Data Aggregation

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Board of Studies Meeting held on 19th June 2021

Plotting and Visualization: A Brief matplotlib API Primer, Plotting with pandas and seaborn,

Course Learning Outcomes: At the end of this course, students will:

- i. Be able to use Jupyter notebooks efficiently.
- ii. Learn how to work with NumPy data types.
- iii. Be proficient in pandas Series.
- iv. Be proficient in pandas DataFrames.
- v. Understand how to use data visualization.
- vi. Know how to import and clean data.
- vii. Work through a complete data analysis to understand how the tools interact with each other.

Text Book:

1. Wes McKinney, Python for Data Analysis, Shroff Publications and Distributors

Reference Book:

1. Michael Milton, A Brain Friendly Guide: Head First Data Analysis, Shroff Publications and Distributors.

BSCHAI – 143 Web Technology

Time Allowed: 3 Hours
Number of Lecture per Week: 4
Pass Percentage: 35%
CREDITS: 4(4L)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To teach the basics involved in publishing content on the World Wide Web.
- ii. To introduce the 'language of the Web' – HTML, the fundamentals of how the Internet and the Web function.
- iii. To introduce more advanced topics such as programming and scripting.

Section A

Introduction to HTML: Basic HTML concepts, an overview of HTML markup.

What is good Web design, the process of Web publishing, implementation, the phases of Web site development, HTML's role in the Web, and issues facing HTML and the Web.

HTML overview: the structure of HTML documents; document types, the <HTML>element; the <HEAD> element, the <BODY> element.

Links and Addressing: Linking basics, what are URLs; linking in HTML, anchor attributes, images and anchors, image maps; semantic linking with the <LINK> element, meta-information.

HTML and Images: The role of images on the Web, image preliminaries; imagedownloading issues, obtaining images, HTML image basics, images as buttons.

Introduction to Layout: Backgrounds, Colors, and Text, Design requirements, HTML approach to Web design, fonts, colors in HTML, document-wide color attributes for <BODY>, and background images. Introduction to lists, tables, frames.

Section B

Basic Interactivity and HTML: Forms form preliminaries; the <FORM> element; form controls.

Style Sheets: style sheets basics, style sheet example, style sheet properties, positioning with style sheets.

Javascript: Client side scripting, What is Javascript, How to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition

Introduction to Bootstrap: Introduction to Bootstrap Framework, need of Bootstrap, history of Bootstrap, advantages of Bootstrap Framework, responsive web page, how to remove Responsiveness, major features of Bootstrap.

Course Learning Outcomes: At the end of this course, students will be able to:

- i. Analyze a web page and identify its elements and attributes.
- ii. Create web pages using HTML and Cascading Style Sheets.

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- iii. Build dynamic web pages using JavaScript (Client side programming).
- iv. Develop a dynamic webpage by the use of java script.

Text Books:

- 1. Jeffrey C Jackson, "Web Technology – A computer Science perspective", Persoson Education.
- 2. Thomas A. Powell, "HTML: TheComplete Reference", Osborne/McGraw-Hill

References:

- 1. Deitel,Deitel and Nieto: Internet&WWW.Howtoprogram,2nd Edition,Pearson Education Asia.
- 2. EStephenMack,JananPlatt:HTML4.0,NoExperienceRequired,1998,BPB Publications.
- 3. "HTMLComplete"bySybex, BPBPublications.
- 4. Bayross, "Web EnabledCommercial Applications Development Using HTML, DHTML, JavaScript, Perl CGI,"Third Edition, BPBPublications.
- 5. ScottMitchell, "DesigningActiveServer Pages,"O Relly.
- 6. KeithMorneau,JillBatistick,"ActiveServerPages",FirstEdition,VikasThomson Learning.
- 7. Smith, A. Eric, "ActiveServer Pages 3 Programming Bible", Wiley India.

BSCHAI – 144 (i) Software Engineering

Time Allowed: 3 Hours
Number of Lecture per Week: 6
Pass Percentage: 35%
Credits: 6(5L+1T)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are to provide:

- i. An understanding of the current issues and practices in software engineering with an emphasis on the software development process.
- ii. An ability to understand the software planning and management.
- iii. Ability to plan software requirements specifications, system modeling, quality specifications, and program specifications.
- iv. An understanding of software design approaches.
- v. An understanding of the requirements of software project management.
- vi. An ability to recognize social, ethical, cultural, and safety issues in software deployment.

Section A

Introduction–TheProblemDomain,SoftwareEngg.Challenges,SoftwareEngg.Approach.

Software developmentlife cycle, its phases, **Software development process models**

:Waterfall, Prototyping,Iterative;

Software Process- Characteristics of software process, Project management process, Softwareconfigurationmanagement process.

ProjectPlanning–activities,COCOMOmodel.**SoftwareMetrics**–Definition,Importance, Categories of metrics.

SoftwareQuality– Attributes,Cyclomaticcomplexitymetric.

SoftwareRequirementsAnalysis–NeedforSRS,Dataflowdiagrams,DataDictionary, entityrelationship diagram, Characteristics andcomponents of SRS, validation, metrics

SectionB

SoftwareDesign–Designprinciples,Module-levelconcepts,StructureChartandStructured

Design methodology,, verification, metrics : network metrics, informationflowmetrics. **Coding** –

Programming Principles and Guidelines, Verification- code inspections, static analysis.**SoftwareTesting**–testingfundamentals,BlackBoxTesting:Equivalenceclass

partitioning,Boundaryvalueanalysis,cause-effectgraphing;**WhiteBoxTesting**: Control flowandDataflowbasedtesting,mutationtesting;levelsoftesting,testplan,testcase specification, test case execution and analysis,

Software maintenance–Categoriesofmaintenance.

Software Reliability–Definition,uses of reliabilitystudies

Course Learning Outcomes: At the end of this course, students will be able to:

- i. Design a specification a software system for any existing system.

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- ii. Plan a design of software system as per the specification.
- iii. Implement a software system it with readable, reusable, modular and object-oriented techniques.
- iv. Design a test procedure for validity, correctness and completeness.
- v. Implement a software maintenance schedule.

Text Book:

1. An Integrated approach to Software Engineering, Third Edition, Pankaj Jalote, Narosa Publications.

References:

1. Software Engineering, Revised Second Edition , K.K. Aggarwal, Yogesh Singh, New Age International Publishers.
2. SoftwareEngineering–A Practitioner’s Approach, Fifth Edition, Roger. S. Pressman, McGrawHill

BSCHAI – 144 (ii) Cyber Security and Information Assurance

Time Allowed: 3 Hours

Max. Marks: 100

Number of Lecture per Week: 6

External Marks: 70

Pass Percentage: 35%

Internal Assessment: 30

CREDITS: 6(5L+1T)

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. Exhibit knowledge to secure corrupted systems, protect personal data and secure computer networks in an Organization.
- ii. To practice with an expertise in academics to design and implement security solutions.
- iii. To understand key terms and concepts in Cryptography, Governance and Compliance.
- iv. To develop cyber security strategies and policies
- v. To understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

Section A

Critical characteristics of Information - NSTISSC Security Model -Components of information System –SDLC – Information assurance - Security Threats and vulnerabilities - Overview of Security threats— Security Standards .

Classical Cryptography - Symmetric Cryptography- Asymmetric Cryptography - Modern Cryptography – Access Control - DRM – Steganography – Biometrics.

Network security - Intrusion Prevention, detection and Management - Firewall – Ecommerce Security - Computer Forensics - Security for VPN and Next Generation Networks.

Section B

Host and Application security -Control hijacking, Software architecture and a simple buffer overflow - Common exploitable application bugs, shellcode - Buffer Overflow - Side-channel attacks - Timing attacks, power analysis, cold-boot attacks, defenses – Malware - Viruses and worms, spyware, key loggers, and botnets; defenses auditing, policy - Defending weak applications - Isolation, sandboxing, virtual machines.

Mobile, GSM and Wireless LAN security - Protection measures - Business risk analysis – Information Warfare and Surveillance – Case study on Attack prevention, detection and response.

Course Learning Outcomes: At the end of this course:

- i. The learner will gain knowledge about securing both clean and corrupted systems, protect personal data and secure computer networks.
- ii. The learner will understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.

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- iii. The learner will understand principles of web security.
- iv. The learner will be able to incorporate approaches for incident analysis and response.
- v. The learner will develop an understanding of security policies (such as confidentiality, integrity, and availability), as well as protocols to implement such policies.

References:

1. William Stallings, "Cryptography and Network Security: Principles and Practice", 6 th Edition, PHI.
2. Michael E. Whitman and Herbert J Mattord, "Principles of Information Security", 6 th edition, Vikas Publishing House.
3. Bill Nelson, Amelia Phillips, F.Enfinger and Christopher Stuart, "Guide to Computer Forensics and Investigations, 4 th ed., Thomson Course Technology.
4. Matt Bishop, "Computer Security: Art and Science", 1st edition, Addison-Wesley Professional.

BSCHAI – 144 (iii) Social Networking and Mining

Time Allowed: 3 Hours

Max. Marks: 100

Number of Lecture per Week: 6

External Marks: 70

Pass Percentage: 35%

Internal Assessment: 30

Credits: 6(5L+1T)

Instructions for the Paper Setter

The question paper will consist of three sections: A, B & C. Sections A& B will have four questions each from the respective sections of the syllabus carrying 10.5 marks for each question. Section C will have 5-10 short-answer type questions carrying at total of 28 marks, which will cover the entire syllabus uniformly.

Instructions for the Candidates

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Course Objectives: The main objectives of this course are:

- i. To have an introduction with Statistical Properties of Social Networks and its Analysis.
- ii. To model and visualize social Networks with different techniques such as Graphs, Clustering and random walks.
- iii. To understand the applications of Community Mining Algorithms.

Section A

Introduction- Introduction to Web - Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Statistical Properties of Social Networks -Network analysis - Development of Social Network Analysis - Key concepts and measures in network analysis - Discussion networks - Blogs and online communities - Web-based networks.

Modeling And Visualization- Visualizing Online Social Networks - A Taxonomy of 26 Visualizations - Graph Representation - Centrality- Clustering - Node-Edge Diagrams - Visualizing Social Networks with Matrix-Based Representations- Node-Link Diagrams - Hybrid Representations - Modelling and aggregating social network data – Random Walks and their Applications –Use of Hadoop and Map Reduce - Ontological representation of social individuals and relationships.

Mining Communities- Aggregating and reasoning with social network data- Advanced Representations - Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities – Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks.

Section B

Text and Opinion Mining- Text Mining in Social Networks -Opinion extraction – Sentiment classification and clustering - Temporal sentiment analysis - Irony detection in opinion mining - Wish analysis - Product review mining – Review Classification – Tracking sentiments towards topics over time.

Tools for Social Network Analysis- UCINET – PAJEK – ETDRAW – StOCNET – Splus – R – NodeXL – SIENA and RSIENA – Real world Social Networks (Facebook- Twitteretc.)

Course Learning Outcomes: At the end of this course, students will be:

- i. Familiar with Visualization and Modeling of Social Networks.

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- ii. Able to understand the concept of Text and Opinion Mining.
- iii. Capable of using different tools for Social Network Analysis.

References:

1. Charu C. Aggarwal, “Social Network Data Analytics”, Springer.
2. Peter Mika, “Social Networks and the Semantic Web”, 1 st edition, Springer.
3. BorkoFurht, “Handbook of Social Network Technologies and Applications”, 1st edition, Springer.

BSCHAI – 145 Programming Lab-V
(Based on BSCHAI-142)

Time Allowed: 3 Hours

Number of Practicals per Week: 4

Pass Percentage: 35%

CREDITS: 2(4P)

Max. Marks: 100

External Marks: 70

Internal Assessment: 30

This course will mainly comprise of exercises on the basis of the following theory paper BSCHAI-142: Data Analysis using Python.

***The splitting of marks is as under:**

Maximum Marks for Continuous Assessment: 30

Maximum Marks for University Examination: 70

BSCHAI – 146 Software Lab-I
(Based on BSCHAI-143)

Time Allowed: 3 Hours
Number of Practicals per Week: 4
Pass Percentage: 35%
Credits: 2(4P)

Max. Marks: 100
External Marks: 70
Internal Assessment: 30

This course will mainly comprise of exercises on the basis of the following theory paper BSCHAI-143: Web Technology.

***The splitting of marks is as under:**

Maximum Marks for Continuous Assessment: 30

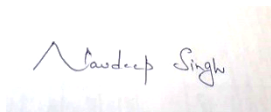
Maximum Marks for University Examination: 70

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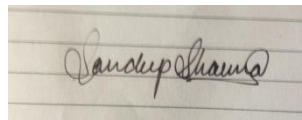
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2. Dr. Dharamveer Sharma

3. Dr. Major Singh Goraya



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5. Mr. Sandeep Sharma



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