

**Course Name:** Data Analytics using Python Programming

**Subject Code:** TBI 401

**Program Name:** Bachelor of Science in Information Technology

**1 Contact Hours:** 45 **L** 3 **T** 0 **P** 0

**2 Examination Duration(Hrs):** **Theory** 0 3 **Practical** 0 2

**3 Relative Weightage:** **CWE:** 25 **MTE:** 25 **ETE:** 50

**4 Credits:** 0 3

**5 Semester:** ☐ ☒ ☐  
**Autumn Spring Both**

**6 Pre-Requisite:** Basic knowledge of object-oriented programming.

**7 Subject Area:** Computer Science

**8 Objective:** To enhance the programming skills.

**9 Course Outcome:**

**CO 1** Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.

**CO 2** Express proficiency in the handling of strings and functions.,

**CO 3** Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets

**CO 4** Identify the commonly used operations involving file systems.

**CO 5** Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python

**CO 6** Integrate the various libraries.

**10 Details of the Course:**

| Unit No. | CONTENT  | CONTACT HOURS |
|----------|--|---------------|
| 1        | <b>Introduction to Python:</b> Where is Python used in the Real World? Installation of Python in Windows, Linux and OSX, Using Interactive shell. Creating, Saving and Running a Python Script.    | 8             |
| 2        | Intro to Python's data types: String, Lists, Dictionaries, Tuples, Files, Variables, Assignments; Immutable variables; Numerical types; Arithmetic operators and expressions; Dynamic Programming. | 10            |
| 3        | <b>Functional Programming:</b> Understanding If-Else, While, For, Iterations. Functions Basics, Scopes and Argument Passing. Advanced Functions. Modules creation and Managing Code with modules.  | 9             |
| 4        | Object oriented programming with Classes. Classes basics and Operator Overloading. Exception Handling: Basics, passing Custom data to  | 10            |

|   |  |           |
|---|--|-----------|
|   | Exceptions.  |           |
| 5 | <b>Essential Python Libraries:</b> "NumPy " & "Pandas".<br><b>NumPy Basics:</b> Arrays and Vectorized Computation, Data Processing Using Arrays.<br>Getting Started with pandas. | 8         |
|   | <b>TOTAL</b>   | <b>45</b> |

## 11 Suggested Books:

| Sl. NO. | NAME OF AUTHERS/BOOKS/PUBLISHERS              | YEAR OF PUBLICATION |
|---------|---|---------------------|
| 1       | "Learning Python" by Mark Lutz                |                     |
| 2       | "Python Essential Reference" by David Beazley |                     |
| 3       | "Python Cookbook" by David Beazley            |                     |
| 4       | "Python for Data Analysis" by Wes Mckinney    |                     |

**Course Name:** Data Warehousing and Mining

**Subject Code:** TBI 402

**Program Name:** Bachelor of Science in Information Technology

**1 Contact Hours:** 45 **L** 3 **T** 0 **P** 0

**2 Examination Duration(Hrs):** **Theory** 0 3 **Practical** 0 0

**3 Relative Weightage:** **CWE:** 25 **MTE:** 25 **ETE:** 50

**4 Credits:** 0 3

**5 Semester:** ☐ Autumn ☒ Spring ☐ Both

**6 Pre-Requisite:** Knowledge of DBMS

**7 Subject Area:** Computer Applications

**8 Objective:** To familiarize students with Data Warehousing and Data Mining.

**9 Course Outcomes:** A student who successfully fulfills the course requirements will be able to:  
Co 1. Discuss the role of data warehousing and enterprise intelligence in industry and government.  
Co.2 Summarize the dominant data warehousing architectures and their support for quality attributes.  
Co.3 Apply suitable pre-processing and visualization techniques for data analysis  
Co.4 Taking cognizance of the contribution of paradigms from the fields of Artificial Intelligence and Machine learning.  
Co.5 Compare and contrast the dominant data mining algorithms.  
Co.6 Recognize and describe at least three computational approaches to data clustering.

**10 Details of the Course:**

| Unit No. | CONTENT  | CONTACT HOURS |
|----------|--|---------------|
| 1        | <b>Introduction to Data Mining and Data Warehouse</b><br>Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining. | 10            |

|          |   |           |
|----------|---|-----------|
|          | Data Warehousing: Overview, Definition, Data Warehousing Components, Building a Data Warehouse, Mapping the Data Warehouse to a Multiprocessor Architecture, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data warehouse Measures, their categorization and computation, Operations in OLAP, Advantages of OLAP over OLTP. |           |
| <b>2</b> | <b>Data Preprocessing</b><br>Need for preprocessing Descriptive data summarization, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation.  | 9         |
| <b>3</b> | <b>Introduction to Data Mining</b><br>Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues.<br><b>Data Mining Techniques :</b> Association rules: Association rules from transaction database & relational database, Apriori algorithm and correlation analysis.                                | 8         |
| <b>4</b> | <b>Data Mining Techniques</b><br>Classification and predication, Issues related to classification & prediction, decision tree induction, Bayesian classification. Classification methods K-nearest neighbor classifiers.<br>Introduction to Clustering techniques, Data types in cluster analysis, categories of clustering techniques: partition method, and Hierarchical method.  | 10        |
| <b>5</b> | <b>Overview of Advanced Features of Data Mining</b><br>Mining complex data objects, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Databases and mining Word Wide Web.   | 8         |
|          | <b>TOTAL</b>  | <b>45</b> |

## 11 Suggested Books:

| Sl. NO.  | NAME OF AUTHERS/BOOKS/PUBLISHERS   | YEAR OF PUBLICAT ION/REPRI NT |
|----------|--|-------------------------------|
| <b>1</b> | Alex Berson and Stephen J. Smith, “ Data Warehousing, Data Mining & OLAP”, TataMcGraw – Hill Edition | 2007                          |
| <b>2</b> | Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”,Third Edition, Elsevier       | 2012                          |

**Program Name:** B. Sc. (IT

**Course Name:** Cryptography

**Subject Code:** TBI-403

**1 Contact Hours:** 45 **L** 3 **T** 0 **P** 0

**2 Examination Duration(Hrs):** **Theory** 0 3 **Practical** 0 0

**3 Relative Weightage:** **CWE:** 25 **MTE:** 25 **ETE:** 50

**4 Credits:** 0 3

**5 Semester:** ☒ ☐ ☐  
**Autumn Spring Both**

**6 Pre-Requisite:** Basics of the Networking

**7 Subject Area:** Cryptography and Security

**8 Objective:** To familiarize students with the Security algorithms regarding the networking issue

**9 Course Outcome:** A student who successfully fulfills the course requirements will be able to-

- a. Identify some of the factors driving the need for security and cryptography.
- b. Identify and classify particular examples of attacks.
- c. Understand the basics of symmetric key cryptography.
- d. Understand the basics of Asymmetric key cryptography.
- e. Understand the concept of Hash functions and their use.
- f. Understand the basics Digital Signatures.

**10 Details of the Course:**

| Unit No. | CONTENT  | CONTACT HOURS |
|----------|--|---------------|
| 1        | <b>Introduction to Cryptography:</b> Introduction To Cryptography, Security Goals, Cryptographic Attacks. Mathematics of Cryptography: Modular Arithmetic, Congruence and Matrices. Conventional Encryption Model, Symmetric Key Ciphers, Categories of Symmetric Key Ciphers. Stream and Block Ciphers, | 9             |
| 2        | Modern Block Ciphers: Components of Modern Block Ciphers, Thoughts of Feistel Design, Block Cipher Principles, Product Ciphers. Simplified DES, DES Structure, DES Standard, DES Strength, Differential & Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes Of Operation.         | 9             |

|          |  |           |
|----------|--|-----------|
|          | Multiple DES: Double DES, Triples DES. Introduction to AES.  |           |
| <b>3</b> | <b>Advanced Encryption Algorithms:</b> Blowfish Algorithm, International Data Encryption Algorithm, RC-5, Symmetric Key Distribution, Random Number Generators, Placement Of Encryption Function.  | 9         |
| <b>4</b> | <b>Public Key Encryption:</b> Difference between Symmetric and Asymmetric key Cryptosystems, Public-Key Cryptography: Principles Of Public-Key Cryptosystems, RSA Algorithm, Rabin Cryptosystem, ElGamal Cryptosystem, Key Management, Public Key Distribution, Fermat's & Euler's Theorem.  | 9         |
| <b>5</b> | <b>Hash Functions:</b> Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security Of Hash Function & MACS, MD-5 Message Digest Algorithm, Secure Hash Algorithm (SHA-512), Digital Signatures: Digital Signature Standard, Authentication Protocol, Digital Signature Algorithm (DSA). | 9         |
|          | <b>TOTAL</b>   | <b>45</b> |

#### 11 Suggested Books:

| Sl. NO.  | NAME OF AUTHERS/BOOKS/PUBLISHERS  | YEAR OF PUBLICAT ION |
|----------|---|----------------------|
| <b>1</b> | William Stallings, "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey. | 2002                 |
| <b>2</b> | Johannes A. Buchmann, "Introduction to cryptography", Springer-Verlag.                                      | 2004                 |
| <b>3</b> | Atul Kahate, "Cryptography and Network Security", TMH   | 2008                 |
| <b>4</b> | Behrouz A Forouzan, "Cryptography and Network Security", McGraw Hill, 3 <sup>rd</sup> ED.                   | 2016                 |

**Course Name:** Android Programming

**Course Code:** TBI 404

**Program Name:** B. Sc. IT

**1 Contact Hours:** 48 **L** 3 **T** 1 **P** 0

**2 Examination Duration (Hrs):** **Theory** 0 3 **Practical** 0 2

**3 Relative Weightage:** **CWE:** 25 **MTE:** 25 **ETE:** 50

**4 Credits:** 0 4

**5 Semester:** ☐ ☒ ☐  
**Autumn Spring Both**

**6 Pre-Requisite:** Object oriented programming using Java Language is expected for the course.

**7 Subject Area:** Mobile Development

**8 Objective:** To provide the students with the knowledge and skills needed to develop Mobile Applications by using Android Programming.

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

CO1. Analyze the components of Android to design applications.

CO2. Apply the development tools in the Android development environment.

CO3. Create applications using all the major UI components and analyze the life cycles of Activities, Fragments and Intent.

CO4. Design applications using all the widgets and layouts that will show the power of Android Programming.

CO5. Design applications to implement the concept of files and SQLite Database.

CO6. Analyze and implement the concept of Telephony, and messaging.

**10 Details of the Course:**

| Unit No. | CONTENT  | CONTACT HOURS |
|----------|--|---------------|
| 1        | <b>Unit I: Introduction to Android:</b> Introduction of Android, OHA, Features of Android, History, versions, Android Architecture, Android core building blocks, Android Emulator, <b>Configuring Android Development Environment:</b> Downloading and installing JDK and Net beans, Downloading and installing Android Studio. <b>Creating First Android App:</b> Creating new Android Project, Creating AVD. <b>Android</b> | 10            |

|          |  |           |
|----------|--|-----------|
|          | <b>project files:</b> Android Manifest.xml, MainActivity.java, R.java, activity_main.xml etc. <b>Android Tools:</b> DVM, AVD Manager, Android SDK Manager, Android Emulator, DDMS, resource folder.  |           |
| <b>2</b> | <b>Unit II: App Components:</b> Activity, Service, Broadcast Receiver, and Content Provider. <b>Activity:</b> Creating an Activity, Starting an Activity, Lifecycle of an Activity. <b>Views:</b> Button, Text View, Edit Text, Radio Button, Image View, Toast, Adapter, Spinner, List View, Grid View, ToggleButton, AutocompleteTextview. | 12        |
| <b>3</b> | <b>Unit III: Intent:</b> What is Intent, Why Intent? Types of Intent, Intent Filters. <b>Android Menu. User Interface:</b> layout types and attributes, UI controls, <b>Event handling. Widgets:</b> CheckBox, RadioButton, Alert Dialog, List View, Date Picker, Time Picker, Progress Bar.   | 10        |
| <b>4</b> | <b>Unit IV: SQLite database:</b> Introduction to SQLite Database and SQLiteOpenHelper class.<br><b>Querying a database:</b> Inserting, searching, updating and deleting a record.  | 8         |
| <b>5</b> | <b>Unit V: Telephony:</b> Understanding TelephonyManager class, display phone information, phone call state.<br><b>SMS:</b> Introduction of SmsManager Class, Sending and receiving sms. Introduction of Sensor devices.   | 8         |
|          | <b>TOTAL</b>   | <b>48</b> |

#### 11 Suggested Books:

| Sl. NO.  | NAME OF AUTHERS/BOOKS/PUBLISHERS   | YEAR OF PUBLICAT ION |
|----------|--|----------------------|
| <b>1</b> | Android Application Development Cookbook, by Wei-Meng Lee, John Wiley and Sons, 2013               | 2013                 |
| <b>2</b> | Professional Android 4 Development by Reto Meier, John Wiley and Sons, 2012                        | 2012                 |
| <b>3</b> | Android in Action, Third Edition, by W. Frank Ableson, RobiSen, Chris King, C. Enrique Ortiz, 2012 | 2012                 |
| <b>4</b> | Beginning Android 4, by Grant Allen, Apress, 2011  | 2011                 |



**Subject Name:** Project Management and Information Systems

**Subject Code:** TBI- 405

1. Contact Hours: 42 L: 3 T: 1 P: 0

2. Examination Duration(Hrs): Theory 

|   |   |
|---|---|
| 0 | 3 |
|---|---|

 Practical 

|   |   |
|---|---|
| 0 | 0 |
|---|---|

3. Relative Weightage: CWE 

|    |
|----|
| 25 |
|----|

 MTE 

|    |
|----|
| 25 |
|----|

 ETE 

|    |
|----|
| 50 |
|----|

4. Credits: 

|   |   |
|---|---|
| 0 | 3 |
|---|---|

5. Semester: 

|  |
|--|
|  |
|--|

|   |
|---|
| ✓ |
|---|

|  |
|--|
|  |
|--|

  
Autumn Spring Both

6. **Pre-Requisite:** Basics of the Software Engineering concepts

7. **Subject Area:** Software Engineering and Information Systems

8. **Objective:** To familiarize students with the how the software project are handled

9. **Learning Outcomes:**

A student who successfully fulfills the course requirements will be able to:

- a) Understand and apply software project planning strategies.
- b) Analyze and implement the scheduling techniques of software projects in terms of cost and size.
- c) Understand the process of software configuration management.
- d) Identify and analyze requirements for information systems
- e) Understand and apply design principles in Information Systems and planning and control.
- f) Identify and define Manufacturing and Service Systems.

**10.Details of the Course:**

| Sl.NO | CONTENT  | CONTACT HOURS |
|-------|--|---------------|
| 1.    | <b>Overview of Software Project Planning:</b> Software Project, Categorization of software Project, Introduction to Stepwise Project Planning, Project Scope, Infrastructure, Resource Allocation, Project Plan Execution. <b>Estimation:</b> Software Project Estimation, Decomposition Techniques- Software Sizing, Problem Based estimation, LOC based estimation, Function Point based estimation, Process Based estimation, Cost Benefit analysis, Cost Estimation Models, Selection of Technologies. | 8             |
| 2.    | <b>Project Scheduling:</b> Basic Concepts, Project Scheduling- Basic Principles, Relationship between People and Effort, Task Network, Scheduling, Gantt and PERT charts, Staffing, Project monitoring and control.<br><b>Software configuration management:</b> Concepts and definitions, Need and  | 8             |

|    |  |           |
|----|--|-----------|
|    | importance of SCM, Benefits of SCM, The SCM Process, Plan preparation with case study, Infrastructure setup, Team Training, System Operation, System Maintenance, System Retirement. Configuration Baselines, Interface Control, Metrics change control –Submitting Change Request, Request Analysis, Request Disapproval and Request Approval Configuration Control Tool.   |           |
| 3. | <b>Information and information systems:</b> Concept of Information system, Components of information system, Transaction Processing System (TPS) - Office Automation System (OAS), Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS)-Expert System(ES) Executive Support System (EIS or ESS).   | 10        |
| 4. | <b>Concepts of Planning &amp; Control:</b> Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization. <b>Information System Planning:</b> Information System Development, Analysis, Design, Testing, Evaluation & Implementation.   | 10        |
| 5. | Manufacturing and Service Systems, Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - IS in hospital, hotel, bank , <b>Enterprise Resources Planning (ERP):</b> Features, selection criteria, merits, issues and challenges in Implementation, <b>ERP related Technologies:</b> Supply Chain Management (SCM): Features, Modules in SCM, Customer Relation Management(CRM), E-Commerce applications. | 10        |
|    | <b>TOTAL</b>   | <b>42</b> |

### 13. Suggested Books:

| Sl.NO | NAME OF AUTHERS/BOOKS/PUBLISHERS  | YEAR OF PUBLICATION/ REPRINT |
|-------|---|------------------------------|
| 1.    | Pressman, Roger S., "Software Engineering: A Practitioner's Approach Ed. Boston: McGraw Hill, 6 <sup>th</sup> edition, 2001 | 2002                         |
| 2.    | Shtub, Bard, and Globerson, "Project Management: Engineering, Technology, & Implementation", Prentice Hall                  | 2001                         |
| 3.    | Bob Hughes, Mike Cotterell, "Software Project Management", 3rd Edition, McGrawHill  | 2005                         |
| 4.    | ", Kenneth J Laudon, Jane P.Laudon, "Management Information Systems", Pearson/PHI, 10/e, 2007                               | 2002                         |
| 5.    | W. S. Jawadekar, "Management Information Systems", , Tata McGraw Hill Edition, 3/e, 2004                                    | 2001                         |

**Subject Name:** Career Skills - II

**Subject Code:** TBI 406

**Course Name:** BSc IT

**1 Contact Hours:** 30 **L** 2 **T** 0 **P** 0

**2 Examination Duration (Hrs):** **Theory** 0 2 **Practical** 0 0

**3 Relative Weightage:** **CWE:** 25 **MTE:** 25 **ETE:** 50

**4 Credits:** 0 2

**5 Semester:** ☒ ☐ ☐  
**Autumn Spring Both**

**6 Pre-Requisite:** Basic concepts of Logic and application

**7 Subject Area:** Quantitative Aptitude

**8 Objective:** Prepare the students for the quantitative aptitude part for campus placement and competitive exams

**9 Course Outcomes:** A student who successfully fulfills the course requirements will be able to:

CO 1. Apply the properties of numbers and the other concepts to solve different problems on number theory.

CO 2. Understand the concepts of profit loss and simple interest and compound interest to solve different types of problems.

CO 3. Apply the concepts of Ratio and Proportion to solve the different types of questions in mixtures and solutions.

CO 4. Analyze the relation between speed, distance and time to effectively solve the problems of relative speed, boats and streams and trains.

CO 5. Understand the concept of Permutation, Combination and Probability to apply and practice the different types of questions.

**10 Details of the Course:**

| Unit No. | CONTENT   | CONTACT HOURS |
|----------|---|---------------|
| 1        | Classification of numbers, rules of divisibility, properties of remainders, LCM-HCF and their applications, concept of the last digit, concept of alpha numerals. Practice of questions based on number system concepts.<br>Concept of percentage and percentage equivalent of fractions, multiplication factor, importance and understanding of the base in calculations, concept and application of the successive percentage change rule | 7             |

|              |  |           |
|--------------|--|-----------|
| <b>2</b>     | Concept of profit, loss and discount and its application. Understanding and practice of questions based on addition of impurity and unequal quantity buying and selling concept.<br>Concept and understanding of simple and compound interest and their difference, understanding CI as an application of the successive percentage change rule, concept of effective rate of interest and practice of all the types of problems in SI and CI. | <b>6</b>  |
| <b>3</b>     | Concept of ratio proportion and its application. Concept, understanding and practice of mixtures and solutions including alligation and replacement of part of a solution.<br>Concept and understanding of average, weighted average and its application. Practice of problem based on age related concepts.   | <b>5</b>  |
| <b>4</b>     | Concepts of time, speed and distance, understanding the direct and inverse relations in the topic, average speed and its application. Understanding the concept and application of relative speed and practice of problems based on trains and boats and streams.<br>Concepts of time and work and its application based problems using the LCM method for individual efficiencies and practice of problems based on group efficiencies.       | <b>6</b>  |
| <b>5</b>     | Concept, understanding and practice of questions based on permutation and combination, difference in the approach for different things and identical things. Concept, understanding and practice of questions based on probability.  | <b>6</b>  |
| <b>TOTAL</b> |  | <b>30</b> |

#### **11 Suggested Books:**

| <b>Sl. NO.</b> | <b>NAME OF AUTHERS/BOOKS/PUBLISHERS</b>   | <b>YEAR OF PUBLICAT ION</b> |
|----------------|---|-----------------------------|
| <b>1</b>       | R.S.Aggarwal, Quantitative Aptitude for Competitive Exams, S.Chand, 20 <sup>th</sup> Edition. | 2013                        |
| <b>2</b>       | P.A.Anand, Quantitative Aptitude for Competitive Exams, Wiley Publication, First Edition.     | 2015                        |