# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


**Programme: Bachelor of Science (Data Science)**
**Semester I**

**Title of the Course: Introduction to Computational Thinking & Data Science**

**Syllabus for 4 credits**
**From the Academic Year 2026-2027**

## **Name of the Course:** Introduction to Computational Thinking & Data Science

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the Course:** | Computational thinking is a problem-solving approach that involves breaking down complex problems into smaller, manageable parts and developing step-by-step solutions that a computer can understand. It's not just about coding—it's about thinking logically, recognizing patterns, creating algorithms, and using abstraction to simplify problems. This way of thinking helps in designing efficient solutions that can be automated using computers. |
| 2 | **Vertical:** | Major - Mandatory. |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 4 credits |
| 5 | **Hours Allotted:** | 60 Hours |
| 6 | **Marks Allotted**: | 100 Marks<br>Continuous Evaluation 40 Marks<br>Semester End Examination 60 Marks |
| 7 | **Course Objectives**:<br><br>1. To introduce Learners to logical problem- solving, algorithmic thinking, abstraction, and basic programming principles.<br>2. To build on programming skills to collect, clean, manipulate and visualise data.<br>3. To introduce statistical foundations and basic machine learning techniques for data-driven insight.<br>4. To cover advanced topics, real-world applications, deployment and ethical issues in data science. | |
| 8 | **Course Outcomes**:<br>**Learners will be able to**<br><br>1. decompose a problem into parts, recognise patterns, and design an algorithm.<br>2. manage real datasets: load, clean, transform and explore them.<br>3. understand statistical thinking and how it underpins data science.<br>4. handle more complex data-science pipelines and understand deployment issues. | |

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| 9 | **Module 1: Foundations of Computational Thinking (15 Hours)** |
| | 1. **Introduction to Computational Thinking:** Data Logic - History of Computational Thinking Applications of Computational Thinking.<br>2. **What is computational thinking** — decomposition, pattern recognition, abstraction, algorithm design, Basic data types, variables, expressions, control flow (if/else, loops),Functions / procedures, modularity, recursion,<br>3. **Data structures basics:** arrays/lists, stacks, queues Algorithmic thinking: simple search and sort (linear search, bubble sort), Debugging, testing, computational complexity (introduction),Practical programming exercise (in e.g. Python) applying above concepts.<br>4. **Project:** Solve a real- world small problem by breaking it down and coding a solution. |
| | **Module 2: Data Handling & Exploratory Analytics (15 Hours)** |
| | 1. **Introduction to data:** types of data (numerical, categorical), sources, formats (CSV, JSON) Data collection methods and issues (missing data, noisy data)<br>2. **Data cleaning & pre-processing:** handling missing values,outliers,normalisation/standardisation, Data structures in practice: using libraries (e.g. pandas in Python) for tabular data<br>3. **Exploratory Data Analysis (EDA):** summary statistics, visualisations (histogram, boxplot, scatterplot),Introduction to databases and queries (SQL basics)<br>4. **Mini- project:** choose a dataset, do cleaning + EDA + present findings |
| | **Module 3: Statistical Thinking & Machine Learning (15 Hours)** |
| | 1. **Recap of probability & statistics:** distributions, expectation, variance, correlation, regression basics, Hypothesis testing, p-values, confidence intervals (overview),Linear regression (simple & multiple) and logistic regression.<br>2. **Introduction to classification and clustering:** k-nearest neighbours, k-means clustering, Overfitting, under fitting, model evaluation metrics (accuracy, precision, recall, F1),Introduction to supervised vs unsupervised learning.<br>3. **Implementation in code:** applying a regression, classification model; cross-validation<br>4. **Project:** Build and evaluate a simple machine-learning model on cleaned dataset |
| | **Module 4: Advanced Data Science Applications & Ethics (15 Hours)** |
| | 1. **Feature Engineering and Big Data Concepts:** Feature engineering, dimensionality reduction (e.g., PCA), time-series and sequence data (overview), big data concepts and tools (overview of Spark, Hadoop), data visualisation at scale — dashboards and interactive plots.<br>2. **Model Deployment and Real-world Applications:** Deployment of models (APIs, web apps, containerisation overview), data science in various domains — healthcare, finance, marketing, and social media.<br>3. **Ethics and Responsible AI:** Ethics, privacy, bias, interpretability of models, legislation (GDPR, data protection laws), responsible and fair AI practices, transparency in model building.<br>4. **Cloud and Automation in Data Science:** Introduction to cloud platforms (AWS, Azure, Google Cloud) for data storage, analysis, and model deployment; automation of machine learning pipelines (AutoML).<br>5. **Capstone Project:** End-to-end data-science workflow — from data collection and pre-processing to model deployment and ethical reflection. |

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| **10** | **Reference Books:** |
| | 1. **Danielle Stein Fairhurst**, *Using Excel for Business and Financial Modelling: A Practical Guide*, Wiley, 3rd Edition, 2019.<br>2. **C.R. Severance**, *Python for Everybody: Exploring Data Using Python 3*, CreateSpace Independent Publishing, 2016.<br>3. **Allen B. Downey**, *Think Python: How to Think Like a Computer Scientist*, O'Reilly Media, 2nd Edition, 2015.<br>4. **Wes McKinney**, *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython*, O'Reilly Media, 2nd Edition, 2017.<br>5. **Jake VanderPlas**, *A Whirlwind Tour of Python & Data Science Handbook*, O'Reilly Media, 2016.<br>6. **Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani**, *An Introduction to Statistical Learning*, Springer, 2nd Edition, 2021.<br>7. **Aurélien Géron**, *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow*, O'Reilly Media, 3rd Edition, 2022. |
| **11** | **Websites:**<br>1. https://scikit-learn.org/<br>2. https://matplotlib.org/<br>3. https://www.datacamp.com/<br>4. https://towardsdatascience.com |

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| **13** | **Internal Continuous Assessment: 40%** | **Semester End Examination: 60%** | |
| **14** | **Continuous Evaluation through:** | Practical Examination | 40 Marks |

**15** **Format of Question Paper:**

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | Attempt any THREE of the following: (From Module I) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |
| 2) | | Attempt any THREE of the following: (From Module II) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |
| 3) | | Attempt any THREE of the following: (From Module III) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |
| 4) | | Attempt any THREE of the following: (From Module IV) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |

## Signatures of Team Members

| Sr. No. | Name | Signature |
|---|---|---|
| 1. | Mr. Deepak Sharma | |
| 2. | Ms. Sabiha Malik | |

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# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


**Programme: Bachelor of Science (Data Science)**
**Semester I**

**Title of the Course: Python Programming**

**Syllabus for 2 credits**
**From the Academic Year 2026-2027**

## **Name of the Course:** Python Programming

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the Course :** | Python is a widely used, beginner-friendly programming language known for its simplicity, readability, and flexibility. Its relevance spans multiple domains including web development, data science, machine learning, automation, and emerging technologies like IoT and blockchain. With rich libraries such as Django for web development and NumPy and Pandas for data analysis, Python enables faster and more efficient problem-solving. |
| 2 | **Vertical :** | Major |
| 3 | **Type :** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted :** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks |
| 7 | **Course Objectives**:<br>Learner will be able to :<br>**1.** To Learn Programming fundamentals using Python & understand the concept of data types and other basic elements in python.<br>**2.** To learn control statements and operators in python and write different functions and strings with the concept of dictionaries, | |
| 8 | **Course Outcomes**:<br>Learner will be able to :<br>**1.** Ability to use variables with different data types and input output functions.<br>**2.** Proficiency in using function and strings and knowledge of dictionaries. | |

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| **9** | **Modules**:- |
| | **Module 1: Introduction to Python & Functions (15 Hours)** |
| | • Introduction to Python Language: Overview, Features of Python, Execution of a Python Program, Innards of Python, Frozen Binaries, Python Interpreter, Comparison of Python with C and Java, Installing Python, Writing & Executing, IDLE 2.<br>• Data Types, Variables and Other Basic Elements: Comments, Docstrings, Data types-Numeric, Compound, Boolean, Dictionary, Sets, Mapping, Basic Elements of Python, Variables.<br>• Input and Output Operations: Input Function, Output Statements, Command Line Arguments Control Statements: Control Statements- Loop Statement, The else Suite, break Statement, continue Statement, pass Statement, assert Statement, return Statement.<br>• Functions: Defining & Calling a Function, Returning Results, Returning Multiple Values, Built in Functions, Parameters and Arguments, Recursive Functions, Anonymous or Lambda Functions. |
| | **Module 2: Libraries and Ski-Kit (15 Hours)** |
| | • Operators: Arithmetic operator, Assignment operators, Unary minus operator, Relational operators, Logical operators, Bitwise operators, Membership operators, Identity operators, Precedence of Operators, Associativity of Operators.<br>• Arrays: Creating Arrays, Indexing and Slicing, Basic Array Operations, Arrays Processing, Mathematical Operations on Array, Aliasing Arrays, Slicing and Indexing in NumPy Arrays, Basic Slicing. Advanced Indexing. Dimensions of Arrays, Attributes of an Array<br>• Strings: Creating Strings, Functions of Strings, Working with Strings, Length of a String, Indexing & Slicing, Repeating& Concatenation of Strings, Checking Membership, Comparing Strings, Removing Spaces, Finding Substrings, Counting Substrings, Strings are Immutable, Splitting and Joining Strings, Changing Case, Checking Starting and Ending of a String, Sorting & Searching in the Strings, Formatting the Strings, Working with Characters<br>• Dictionaries: Creating a Dictionary, Operators in Dictionary, Dictionary Methods, Using for Loop with Dictionaries, Operations on Dictionaries, Ordered Dictionaries |

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| **11** | **Reference Books:**<br>Programming in Python3, Mark Summerfield, Pearson Education, 2nd edition (2018) 2. Learning Python, LutzM, O'Reilly- Shroff, 5th edition, 2013. | |
| **12** | **Internal Continuous Assessment: 40%** | **Semester End Examination : 60%** |
| **13** | **Continuous Evaluation through:**<br><br>Practical Examination : 20 Marks<br>Questions : 16<br>Journal & Viva : 04 | |
| **14** | **Question Paper Pattern for Semester End Examination**<br>**Maximum Marks: 30** **Duration: 1 Hr.**<br>**Note: All questions are compulsory. Each question has an internal choice.**<br><br>***[Refer to Next Page]*** | |

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | **Attempt any 3** | |
| | a) | | 15 |
| | b) | | |
| | c) | | |
| | d) | | |
| | e) | | |
| 2) | | **Attempt any 3** | |
| | a) | | 15 |
| | b) | | |
| | c) | | |
| | d) | | |
| | e) | | |

## Signatures of Team Members

| Sr.No | Name | Signature |
|---|---|---|
| **1.** | Mr. Deepak Sharma | |

# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


**Programme: Bachelor of Science (Data Science)**
**Semester I**

**Title of the Course: Excel For Business**

**Syllabus for 2 credits**
**From the Academic Year 2026-2027**

## **Name of the Course:** Excel for Business

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the Course:** | Excel for Business and Financial Modelling is a specialized course that equips professionals with practical skills to use Microsoft Excel for financial analysis, budgeting, forecasting, and data-driven decision-making. It is highly relevant for careers in finance, accounting, and business analysis, where Excel proficiency is essential. The course bridges the gap between theory and real-world application by teaching participants to create dynamic financial models for strategic planning, risk assessment, and performance evaluation. |
| 2 | **Vertical:** | Vocational Skill Course |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted:** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks<br>Continuous Evaluation 20 Marks<br>Semester End Examination 30 Marks |
| 7 | **Course Objectives**:<br>1. To equip participants with the knowledge and skills to design, build, and manage accurate, well-structured financial models using spreadsheets and Excel tools.<br>2. To enable participants to apply advanced Excel functions and modelling techniques for financial analysis, forecasting, and effective business decision-making | |
| 8 | **Course Outcomes**:<br>1. Learners will develop the ability to design, build, and manage comprehensive financial models using Excel, applying appropriate tools, functions, and techniques for accurate analysis and decision-making.<br>2. Learners will gain practical expertise in structuring, formatting, and presenting financial models effectively to support forecasting, planning, and business problem-solving. | |

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| **9** | **Module 1: Excel for Business and Financial Modelling (15 Hours)** |
| | 1. **Financial Modelling**: Spreadsheet and a Financial Model, Types and Purposes of Financial Models, Tool Selection, Model Design, Design Issues, The Workbook Anatomy of a Model, Project Planning Your Model, Model Layout Flowcharting, Steps to Building a Model, Information Requests.<br>2. **Using Excel in Financial Modelling:** Formulas and Functions in Excel, Handy Excel Shortcuts, Cell Referencing, Named Ranges, Basic Excel Functions, Logical Functions, Nesting Logical Functions.<br>3. **Functions for Financial Modelling**: Aggregation & LOOKUP Functions, Nesting Index and Match, OFFSET Function, Regression Analysis, Choose Function, Working with Dates, Financial Project Evaluation Functions, Loan Calculations.<br>**4. Tools for Model Display and Financial Modelling:** Basic Formatting, Conditional Formatting, Sparklines, Customising the Display Settings, Form Controls, Hiding Sections, Grouping, Array Formulas, Structured Reference Tables, PivotTables, Macros. |
| | **Module 2: Advanced Tools and Techniques in Financial Modelling (15 Hours)** |
| | 1. **Common Uses of Tools in Financial Modelling:** Understanding Nominal and Effective (Real) Rates, Calculating a Cumulative Sum 15 Hrs (Running Totals), How to Calculate a Payback Period, Weighted Average Cost of Capital (WACC), Building a Tiering Table, Modelling Depreciation Methods, Break-Even Analysis.<br>2. **Stress Testing, Scenarios, and Sensitivity Analysis in Financial Modelling**: What are the Differences Between Scenario, Sensitivity, and What-If Analyses? Overview of Scenario Analysis Tools and Methods, Advanced Conditional Formatting, Comparing Scenario Methods, Adding Probability to a Data Table.<br>3. **Presenting Model Output**: Preparing an Oral Presentation for Model Results, Preparing a Graphic or Written Presentation for Model Results, Chart Types, Working with Charts, Handy Charting Hints, Dynamic Named Ranges, Charting with Two Different Axes and Chart Types, Bubble Charts, Creating a Dynamic Chart, Waterfall Charts. |

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|---|---|
| **10** | **Reference Books:** |
| | 1. Using Excel for Business and Financial Modelling: A Practical Guide, by Danielle Stein Fairhurst, Wiley, 3rd Edition, 2019<br>2. Microsoft Excel Professional 2021 Guide: Complete Excel Reference, by CA Manmeet Singh Mehta, Paperback, 1st Edition, 2022<br>3. Microsoft Excel: Advanced Microsoft Excel Data Analysis for Business, by John Slavio, Hardcover, 1st Edition, 2019<br>4. Excel: Excel for Business, by Francesco Iannello, Createspace, 2016 |

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| **11** | **Websites:**<br>1. https://www.w3schools.com/EXCEL/index.php<br>2. Microsoft Excel Help Centre<br>3. https://trumpexcel.com/learn-excel/ |

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| **13** | **Internal Continuous Assessment: 20%** | **Semester End Examination: 30%** | |
| **14** | **Continuous Evaluation through:** | Practical Examination | 20 Marks |

**15** **Format of Question Paper:**

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | Attempt any THREE of the following: (From Module I) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | | | |
| 2) | | Attempt any THREE of the following: (From Module II) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |

## Signatures of Team Members

| Sr. No. | Name | Signature |
|---|---|---|
| **1.** | Mr. Deepak Sharma | |
| **2.** | Ms. Sabiha Malik | |

# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


**Programme: Bachelor of Science (Data Science)**
**Semester I**

**Title of the Course: Introduction to R**

**Syllabus for 2 credits**
**From the Academic Year 2026-2027**

## **Name of the Course:** Introduction to R

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the Course:** | Introduction to R Programming is a foundational course designed to teach students the essential concepts and hands-on skills required to use R for data analysis, statistical computing, and visualization. The course introduces the R environment, syntax, data types, and structures such as vectors, lists, matrices, and data frames. Students learn how to import, clean, manipulate, and summarize data**,** along with creating meaningful visualizations using packages like ggplot2**.** |
| 2 | **Vertical:** | Skill Enhancement Course |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted:** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks<br>Continuous Evaluation 20 Marks<br>Semester End Examination 30 Marks |
| 7 | **Course Objectives**:<br>1. To introduce learners to the fundamentals of R programming, including data structures, control statements, and basic algorithmic logic for problem-solving.<br>2. To develop Learners ability to handle, analyze, and visualize data using R through practical applications of data import, transformation, and statistical analysis. | |
| 8 | **Course Outcomes**:<br>1. Learners will be able to write and execute R programs, use core programming concepts, and apply them to data-driven tasks.<br>2. Learners will gain proficiency in importing, cleaning, analysing, and visualizing data in R using appropriate packages and functions for effective data interpretation | |

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| 9 | **Module 1: Fundamentals of R Programming and Algorithmic Logic (15 Hours)** |
| | **1. Introduction**: R interpreter, Introduction to major R data structures like vectors, matrices, arrays, list and data frames, Control Structures, vectorized if and multiple selection, functions.<br>**2. Programming:** Algorithm, flow chart, Structure of programme, |
| | **Module 2: Data Handling, Analysis, and Visualization in R (15 Hours)** |
| | 1. **Installing, loading and using packages**: Read/write data from/in files, extracting data from web-sites, Clean data, Transform data by sorting, adding/removing new/existing columns, centring, scaling and normalizing the data values, converting types of values, using string in-built functions, Statistical analysis of data for summarizing and understanding data, Visualizing data using scatter plot, line plot, bar chart, histogram and box plot.<br>2. **Loading and handling Data in R:** Getting and Setting the Working Directory – getwd(), setwd(), dir() File Handling in R language, -CSV Files - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File – R -Excel File – Reading the Excel file. |

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| 10 | **Reference Books:** |
| | 1. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data* by Hadley Wickham and Garrett Grolemund, O'Reilly Media, 2nd Edition, 2023.<br>2. *The Art of R Programming: A Tour of Statistical Software Design* by Norman Matloff, No Starch Press, 2nd Edition, 2023.<br>3. *Hands-On Programming with R: Write Your Own Functions and Simulations* by Garrett Grolemund, O'Reilly Media, 1st Edition, 2014.<br>4. *R in Action: Data Analysis and Graphics with R* by Robert I. Kabacoff, Manning Publications, 3rd Edition, 2022.<br>5. *Advanced R* by Hadley Wickham, Chapman & Hall/CRC Press, 2nd Edition, 2019. |
| 11 | **Websites:**<br>1. https://www.r-project.org/<br>2. https://www.tutorialspoint.com/r/<br>3. https://www.w3schools.com/r/<br>4. https://www.geeksforgeeks.org/r-programming-language/ |

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|---|---|---|---|
| **13** | **Internal Continuous Assessment: 20%** | **Semester End Examination: 30%** | |
| **14** | **Continuous Evaluation through:** | Practical Examination | 20 Marks |
| **15** | **Format of Question Paper:** | | |

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | Attempt any THREE of the following: (From Module I) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |
| 2) | | Attempt any THREE of the following: (From Module II) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| | E. | | |

## Signatures of Team Members

| Sr. No. | Name | Signature |
|---|---|---|
| **1.** | Mr. Deepak Sharma | |
| **2.** | Ms. Sabiha Malik | |

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# As Per NEP 2020

## Tolani College of Commerce
## (Autonomous)

Knowledge is Supreme

**Title of the Course: Introduction to Intellectual Property Rights Law**
**Programmes: Bachelor of Commerce (Taxation & Auditing),**
**Bachelor of Science (Data Science)**
**&**
**Bachelor of Science (Artificial Intelligence and Machine Learning)**
**Semester: I**

**Syllabus for 4 Credits Course**
**From the academic year: 2026-2027**

# Name of the Course: Introduction to Intellectual Property Rights Law

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the course:** | Intellectual property rights (IPR) have, in recent years, emerged as perhaps the most important S&T policy instrument. With its growing presence, however, it has also been subjected to intense criticism. Moreover, the structure of the institution itself has undergone periodic changes with incorporations of newer subject matters into its ambit. This course intends to provide an analytical overview of the content and structure of the institution of IPR along with its evolutionary trajectory. In a nutshell, the course will cover the philosophy of intellectual property rights, various technical and legal dimensions of IPR, and implications of IPR for growth and development of science, along with the various socio-economic and ethic-legal consequences of IPR on economic development. Several case studies will be undertaken in the context of India. |
| 2 | **Vertical:** | Open Elective |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 4 Credits |
| 5 | **Hours Allotted:** | 60 Hours |
| 6 | **Marks Allotted**: | 100 Marks<br>Continuous Evaluation: 40<br>Semester-End: 60 |
| 7 | **Learning Objectives**<br>• To introduce fundamental aspects of Intellectual Property Rights and Trade Marks to learners who are going to play a major role in development and management of innovative projects in industries.<br>• To disseminate knowledge on copyrights and trade secrets and its related rights and registration aspects<br>• To disseminate knowledge on patents, patent regime in India and abroad and registration aspects | |

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| | • To make the learners aware about current trends in IPR. |
| **8** | **Learning Outcomes**<br>**Enables the learners to**<br>• Have good knowledge about Intellectual Property Rights and Trade Marks<br>• Have knowledge on copyrights and trade secrets and its related rights and registration aspects.<br>• Have knowledge on patents, patent regime in India and abroad and registration aspects<br>• Becomes aware about the new developments of Intellectual Property. |
| **9** | **Syllabus** |
| | **Module.1. Introduction To Intellectual Property and Trade Mark (15 Hours)** |
| | • **Introduction:** Types of Intellectual Property, International Organizations, Agencies and Treaties, Importance of Intellectual Property Rights.<br>• **Trade Marks**: Purpose And Function of Trade Marks, Acquisition of Trade Mark Rights, Protectable Matter, Selecting and Evaluating Trade Mark, Trade Mark Registration Processes. |
| | **Module.2. Copyright and Trade Secrets (`15 Hours)** |
| | • **Law Of Copy Rights**: Fundamental of Copy Right Law, Originality Of Material, Rights of Reproduction, Rights To Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice of Copy Right, International Copy Right Law.<br>• **Trade Secrets**: Trade Secrete Law, Determination of Trade Secrete Status, Liability for Misappropriations of Trade Secrets, False Advertising. |
| | **Module.3. Patent Rights (15 Hours)** |
| | • **Patent Rights**: Purpose, what is patentable and not patentable, Legal Aspect of Filing a Patent, Specification and Opposition Process under Patent Law from Business Perspective.<br>• **Patent Infringement and Legal Issues**: Licensing of Patent and Business Concerns, Transfer of Technology and Legal Requirements, Utility Patents, Should India have Business Method Patents?, Can Software's be Patented? |
| | **Module.4. New Developments of Intellectual Property (15 Hours)** |
| | • New Developments of Intellectual Property: New Developments in Trade Mark Law; Copy Right Law, Patent Law, Intellectual Property Audits.<br>• Personality Rights and types of Personality Rights: Right to name and Right to Loci. |
| **10** | **References**<br>• **Acharya, N.K.** 2014. Text book of Intellectual Property Rights. Asia Law House, Hyderabad.<br>• **Loganathan, E.T**.2012. Intellectual Property Rights. New Century Publications, New Delhi.<br>• **Rosedar, S.R.A**. 2016. Intellectual Property Rights. Lexis Nexis (2nd Ex.) Nagpur.<br>• **Sreenivasulu NS.** Intellectual Property Rights Dynamic Interfaces published by Universal Law Publishing. 1st Edition 2017. ISBN: 9788131250631.<br>• **Iyengar.** Commentary on Trade Marks Act - Including Schedules, Rules, Notifications, Treaties, Conventions and much more published by Universal Law Publishing. 5thEdition 2016. **ISBN:** 9789350356463.<br>• **Verma Trilochan.** Intellectual Property Protection Handbook published by Universal Law Publishing. 1st Edition 2015. ISBN: 9789350355985. |
| **11** | **Internal Continuous Assessment: 40%** \| **Semester End Examination: 60%** |

**12 Continuous Evaluation through:**

| Sub-components | Maximum Marks | Conditions for passing |
|---|---|---|
| 1) 1st Project/ Report work | 10 | a) A learner must be present for each of the sub-components. |
| 2) 2nd Project/ Report work | 10 | |
| 3) Case Study analyses in the classroom | 10 | |
| 4) 10 Objective Questions (1 MCQ of 1 mark each) | 10 | |
| Total | 40 | |

**13 Format of question paper**

Maximum Marks: 60 Duration: 2 Hour.

All Questions are Compulsory Carrying 15 Marks each.

| Question No | Particular | Marks |
|---|---|---|
| Q-1 | (From Module I)<br>a. Theory (08 Marks)<br>b. Theory (07 Marks)<br>OR<br>c. Theory (08 Marks)<br>d. Theory (07 Marks) | 15 Marks |
| Q-2 | (From Module II)<br>a. Theory (08 Marks)<br>b. Theory (07 Marks)<br>OR<br>c. Theory (08 Marks)<br>d. Theory (07 Marks) | 15 Marks |
| Q-3 | (From Module III)<br>a. Theory (08 Marks)<br>b. Theory (07 Marks)<br>OR<br>c. Theory (08 Marks)<br>d. Theory (07 Marks) | 15 Marks |
| Q-4 | (From Module IV)<br>a. Theory (08 Marks)<br>b. Theory (07 Marks)<br>OR<br>c. Theory (08 Marks)<br>d. Theory (07 Marks) | 15 Marks |

**Signature/s of Team Member/s**

| Sr.No | Name | Signature |
|---|---|---|
| 1. | Dr. Hema Mehta | |

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**As Per NEP 2020**

# Tolani College of Commerce (Autonomous)


**Programmes: Bachelor of Science (Data Science)**
**Bachelor of Science (Artificial Intelligence and Machine Learning)**

**Title of the Course: Principles of Management, Semester I**

## Syllabus for 4 credits

## From the academic year 2026 - 2027

# Name of the Course: Principles of Management

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description the course:** | The course provides an overview of management and its evolution. It examines management functions of planning, organizing, leading, and controlling and its impact on the business organisation. It discusses necessary skills and functions required for efficient manager in contemporary business environment. Overall, it enables students to analyze and understand changing business environment, and the role of ethics, social responsibility and environmental issues in contemporary business environment. |
| 2 | **Vertical:** | Open Electives |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 4 credits |
| 5 | **Hours Allotted:** | 60 Hours |
| 6 | **Marks Allotted**: | 100 Marks<br>Continuous Evaluation 40 Marks<br>Semester End Examination 60 Marks |
| 7 | **Course Objectives**:<br>1. To develop a comprehensive understanding for the learners about the nature of management, including the levels of management and approaches to management.<br>2. To acquaint the learners with the context of organisational management like planning, decision making and delegation of authority.<br>3. To understand various functions of management like organizing, Departmentation and directing.<br>4. To familiarize learners with the various concepts of management like leadership, coordination and controlling and also learn the recent trends in management. | |
| 8 | **Course Outcomes**:<br>1. Learners will be able to demonstrate an understanding of the nature of management, enabling them to analyze and apply different management theories and practices in organisational contexts effectively.<br>2. Learners will be able to summarize the concepts of planning, decision-making, and delegation of authority signifying the ability to formulate strategic plans, make informed decisions, and effectively delegate tasks and responsibilities within a managerial role.<br>3. Learners will utilize the functions of management, including organizing, Departmentation, and directing, to efficiently structure and manage organisational resources, tasks, and personnel, ensuring optimal performance and achievement of organisational objectives.<br>4. Learners will identify key management concepts such as leadership, coordination, and controlling in organisational settings and implementation of control mechanisms to ensure organisational success including sustainable business practices. | |

| 9 | Modules |
|---|---|
| | **Module 1: Nature of Management (15 Hours)** |
| | • Introduction to Management: Meaning and Definitions of management, Features of management and Importance of management.<br>• Interdisciplinary Nature of Management: Management as an Art - Features, Management as Science – Features and Management as a Profession – Features.<br>Levels of Management: Hierarchy of managerial positions – three levels, Roles and<br>• Managerial Skills by Professor Robert Katz, The Blake and Mouton Managerial Grid.<br>Approaches to Management: Techniques of Scientific Management by Frederick Taylor, 14 Principles of Management by Henri Fayol and Contingency Approach of Management. |
| | **Module 2: Planning, MBO, Decision Making and Delegation of Authority (15 Hours)** |
| | • Planning: Meaning and definition of Planning, Elements of Planning and Steps in Planning. Management by Objectives (MBO) by Peter Drucker: Meaning and Assumption, Benefits of management by objective and Limitations of management by objective.<br>• Decision Making: Importance of Decision-making, Decision-making process and Decision-making techniques – Programmed and Non-programmed.<br>• Delegation of Authority: Importance of delegation, three elements of delegation and Principles of effective delegation. |
| | **Module 3: Organising, Departmentation, Approaches and Directing (15 Hours)** |
| | • Organising: Meaning of Organising, Organising structure (Formal and Informal organisation, Line and Staff and Matrix organisation) – meaning, advantages and disadvantages.<br>• Departmentation: Meaning, Importance and Bases of departmentation.<br>Approaches to Organisational Management: Factors of Span of Control, Advantages and Disadvantages of Centralization and Decentralization.<br>• Directing: Meaning, Importance and Principles of direction |
| | **Module 4: Leadership, Coordination, Controlling and Recent Trends (15 Hours)** |
| | • Leadership: Meaning and Features of leadership, Various Leadership styles and Qualities of a good leader.<br>• Coordination: Concept and Importance of Coordination, Coordination- The Essence of management and Techniques of effective coordination.<br>• Controlling: Meaning and Importance of Controlling, Process of Controlling and Techniques of Controlling – Traditional and Modern.<br>Sustainable Business Practices: Green Management – Different Methods and Emerging<br>• Green trends, Corporate Social Responsibility – Importance and latest trends. |

**10** **References:**


• Dr. Rinkesh Chheda and Divya Thakur, Principles of Management, Himalaya Publishing House, 3rd edition, 2022.
• Y.K Bhushan, Fundamentals of Business & Management, Sultan Chand & Sons, 2016.
• V.S.P Rao, Management: Text & Cases, Excel Books, 2nd Revised edition, 2022.
• Dr. Neeru Vasishth and Dr. Vibhuti Vasishth, Principles of Management, Taxmann Publications Pvt. Ltd., 1st edition, 2022
• Stephen P. Robbins, Mary Coulter and David Cenzo, Fundamentals of Management, Pearson Education India, 9th edition, 2016.
• Angelo Kinicki and Brian K. Williams, Management, McGraw-Hill Education, 9th edition, 2020.


**11** **Internal Continuous Assessment: 40%** | **Semester End Examination: 60%**

**12** **Continuous Evaluation through:** (40 Marks)

| Component | Total Marks |
|---|---|
| Assignment/Project Work/Presentation/Case Study | 20 |
| Class Test | 20 |
| Total | 40 |

A learner must be present for each of the sub-components.

**14** **Format of Question Paper:** for the final examination

**Question Paper Pattern for Semester End Examination (SEE)**

**Maximum Marks: 60** **Duration:2 Hour**

| Q. No. | Particular | Marks |
|---|---|---|
| **Q-1** | **Attempt any TWO the following:** (Module 1)<br>A. Full Length Question<br>B. Full Length Question<br>C. Full Length Question | **15 Marks** |
| **Q-2** | **Attempt any TWO the following:** (Module 2)<br>A. Full Length Question<br>B. Full Length Question<br>C. Full Length Question | **15 Marks** |
| **Q-3** | **Attempt any TWO the following:** (Module 3)<br>A. Full Length Question<br>B. Full Length Question<br>C. Full Length Question | **15 Marks** |
| **Q-4** | **Attempt any TWO the following:** (Module 4)<br>A. Full Length Question<br>B. Full Length Question<br>C. Full Length Question | **15 Marks** |

Note: Any of the full length question of 7.5 Marks can be a case study.

## Signatures of Team Members

| Sr. No | Name | Signature |
|---|---|---|
| 1 | Dr. Sadhana Venkatesh | |
| 2 | Ms. Jyoti Ghosh | |
| 3 | Ms. Shalini Clayton | |
| 4 | Ms. Ashiyana Shaikh | |

AC –
Item No. –

# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


Knowledge is Supreme

**Title of the Course: Communication Skills in English - I**
**(Semester I)**

## Programmes:

**Bachelor of Science (Data Science)**
**Bachelor of Science (Artificial Intelligence & Machine Learning)**
**Bachelor of Commerce (Taxation & Auditing)**

**Syllabus for 2 Credit Course**
**From the Academic Year 2026-2027**

# Name of the Course: Communication Skills in English - I

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the course :**<br><br>**Including but not limited to :** | Communication Skills in English will introduce learners to the foundational principles of effective communication in contemporary professional contexts.<br><br>Critical thinking for analysing messages and introduces narrative and data-driven storytelling to enhance clarity, coherence, and impact in business communication. |
| 2 | **Vertical :** | Ability Enhancement Course |
| 3 | **Type :** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted :** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks<br>Continuous Evaluation 20 marks and<br>Semester End Examination 30 marks |
| 7 | **Course Objectives:**<br>1. To familiarise learners with the theoretical foundations of communication, including concepts, processes, workplace channels and technology-enabled communication.<br>2. To enable learners to craft coherent, purposeful written and oral communication, and refine their listening and reading abilities essential for professional success. | |
| 8 | **Course Outcomes**:<br>By the end of this course, learners will be able to:<br>1. Explain core concepts of communication and apply them effectively in professional, workplace and digital environments.<br>2. Draft and deliver coherent, structured and purposeful communication suited to various organisational contexts. | |

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| **9** | **Module 1:Theory of Communication (15 Hours)** |
| | **1. Concept of Communication:**<br>● Meaning, process and need of communication; principles of effective communication (7C's)<br>● Critical thinking in communication: recognising fallacies, evaluating arguments and analysing opinion-based or persuasive messages<br>● Technology-enabled communication and its impact in the corporate, digital and globalised world. |
| | **2. Communication at Workplace:**<br>● Types/Methods of Communication: Verbal Communication -Oral and Written communication, Nonverbal Communication -Vocalics, Kinesics, Haptics, Proxemics, Chronemics, Sign language and Visual aids.<br>● Channels of Communication: Formal -Vertical, Horizontal, Diagonal and Informal– Grapevine.<br>● Importance of ethics in communication. |
| | **3. Barriers to Communication:**<br>● Barriers to communication: Meaning and importance of recognising and addressing barriers to effective communication<br>● Types of Barriers: Physical, Semantic/Language, Cross-Cultural, Socio-Psychological, and Organizational<br>● Strategies to Overcome Barriers. |
| | **Module 2: Language and Writing Skills (15 Hours)** |
| | **1. Listening and Narrative Comprehension:**<br>● Importance of listening skills: active, empathetic and workplace listening.<br>● Barriers to listening and strategies for cultivating effective listening<br>● Storytelling with data: presenting data and information through clear, relatable narratives. |
| | **2. Professional Writing: Formats and Structures:**<br>● Parts and structure of letters and emails; traditional and contemporary layouts.<br>● Formal communication on digital platforms: Email etiquette, Instant Messaging (Messenger/Teams), and LinkedIn writing conventions.<br>● Guidelines for clarity, conciseness and tone in workplace writing. |
| | **3. Workplace Correspondence and Applications:**<br>● Job application writing: cover letters, resumes/CVs.<br>● Acceptance of job offers, resignation letters, apologies, thank-you notes.<br>● Leave applications and other routine workplace requests. |

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|---|---|
| **10** | **Reference Books:**<br>● Insley, Robert. Communicating Professionally in Today's Workplace. 3rd ed., Kendall Hunt Publishing, 2022.<br>● Raman, Meenakshi, and Sangeeta Sharma. Technical Communication: Principles and Practice. Oxford University Press, 2022.<br>● Facione, Peter A. *Think Critically*. 4th ed., Pearson, 2022.<br>● Hughes, William, et al. *Critical Thinking: An Introduction to the Basic Skills*. 8th ed., Broadview Press, 2021.<br>● Knaflic, Cole Nussbaumer. *Storytelling with Data: A Data Visualization Guide for Business* |

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|---|---|---|
| | *Professionals*. Wiley, 2019.<br>● Gallo, Carmine. *The Bezos Blueprint: Communication Secrets of the World's Greatest Salesman*. St. Martin's Press, 2022.<br>● Rosenwasser, David, and Jill Stephen. *Writing Analytically*. 9th ed., Cengage, 2022.<br>● Hynes, Geraldine E. *Managerial Communication: Strategies and Applications*. 7th ed., McGraw-Hill Education, 2020.<br>● Poh, Michael. *Modern Business Writing for Today's Workplace*. Productivity Press, 2021.<br>● Pal, Rajinder, and J. S. Korlahalli. *Essentials of Business Communication*. Sultan Chand & Sons, 2020.<br>● Arun, Vijay. *Professional Communication Skills*. McGraw Hill Education, 2019. | |
| **11** | **Internal Continuous Assessment: 40%** | **Semester End Examination: 60%** |
| **12** | **Continuous Evaluation through:**<br>**(20 marks)** | Reading assignments, email correspondence tasks, listening comprehension exercises, class projects, demonstrations/ exhibitions, class tests, reflective journals, micro-presentations, group discussions, peer reviews, and storytelling-with-data tasks. |

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|---|---|---|---|
| **13** | **Format of SEE Question Paper: (30 marks)** | | |
| | **Question No.** | **Nature of Question** | **Maximum Marks** |
| | **Q-1** | **Short notes: (any 2 of 3)**<br>a)<br>b)<br>c) | **10 Marks** |
| | **Q-2** | **Attempt any 2 of 4:** (Professional Digital Communication Tasks)<br>a) Draft a professional email responding to a workplace scenario<br>b) Write a LinkedIn summary for a given profile<br>c) Rewrite a poorly drafted workplace message using clarity & tone standards<br>d) Draft a short workplace report/announcement (100–120 words) | **10 Marks** |
| | **Q-3** | **Attempt any 1 of 2:**<br>● Convert the given numerical table/graph/brief dataset into a clear, relatable narrative. (120–150 words)<br>OR<br>● Analyse the given passage | **10 Marks** |

**Signatures of Team Members**

| Sr.No. | Name | Signature |
|---|---|---|
| 1. | Ms. Amrita Nambiar | |

# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


## Title of the Course: Environmental Studies- I

**Name of the Programmes:**

1. Bachelor of Commerce (Taxation & Auditing)
2. Bachelor of Science (Data Science)
3. Bachelor of Science (Artificial Intelligence & Machine Learning)

## Semester I

**Syllabus for 2 Credit Course**

**From the academic year- 2026-2027**

# Name of the Course: Environmental Studies- I

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description the course:** | The course is an introductory inter-disciplinary course to understand working earth's systems. It focusses on the holistic study to understand the interrelationship between humans and nature. |
| 2 | **Vertical:** | Value Education Course |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted:** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks<br>Continuous Evaluation 20 Marks<br>Semester End Examination 30 Marks |
| 7 | **Course Objectives**:<br>By end of this course learners should:<br>1. appreciate the different facets of environment and the natural world<br>2. understand the role of humans as agents of environmental degradation | |
| 8 | **Course Outcomes**:<br>The learners shall be:<br>1. sensitised about environmental issues and the need for conservation of environment<br>2. able to appreciate Environmental Science as a multi-disciplinary tool for conservation rather than merely a subject | |

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| **9** | **Module 1: Understanding the environment (15 Hours)** |
| | 1. **Environment:** Meaning, definition, nature, scope and its components; Human and environment relationship<br>2. **Ecosystem:** Definition, Components and types, Functioning and structure- Food Chain and Food Web, Ecological Pyramids, Biogeochemical cycles.<br>3. **Natural Resources:** Definition, importance, Classification, Resource utilisation, Importance of forest, water and energy as natural resources<br>4. **Biodiversity:** Definition, Types of biodiversity, Importance of biodiversity- Intrinsic and Utilitarian value; India as a Megadiverse nation; Biodiversity hotspots in India. |
| | **Module 2: Environmental Degradation and Associated Problems (15 Hours)** |
| | 1. **Rise in human population and urbanization:** Population- Definition, Causes and Impacts of population rise, Concept of Population density; Urbanisation- Definition causes and impacts, Concept of Urban Heat Island<br>2. **Pollution:** Causes and impacts of Air, Water, Land, Noise, Light pollution<br>3. **Climate Change and Global Warming:** Concept, Causes and impacts of Ozone depletion, Natural and human induced causes of Global warming and Climate Change and its implication for nature and society.<br>4. **Nature at risk:** Threats to biodiversity; Impacts of biodiversity loss; IUCN Red data list; Causes and impacts of resource depletion vis-à-vis forest, water and energy |
| **10** | **Reference Books:**<br>1. McKinney M.L. &Schoch R.M., 1998: Environmental Science, Jones & Bartlett Publishers, London<br>2. Rao K.L. 1975: India's Water Wealth, Orient Longman Ltd. New Delhi<br>3. S.S. Negi (1993) Biodiversity and its Conservation in India, Indus Publications, New Delhi<br>4. Rajgopalan C (2015): Environmental Studies. Oxford University Press<br>5. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co.<br>6. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p<br>7. Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.<br>8. Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication<br>9. Mhaskar A.K., Matter Hazardous, Techno-Science Publication<br>10. Zimmerman W E (1972) Zimmerman's World Resources and Industries' Harper & Row |
| **11** | **Other Readings:**<br>1. Down to Earth, Centre for Science and Environment<br>2. Census Handbooks Human Development Report-2019<br>3. Provisional Population Totals Paper 1 of 2011 India, Office of the Registrar General & Census Commissioner India. Product No. 00-001-2011-Cen-Book (E) 13 p.p<br>4. Human Development Report 2020 "The next frontier Human development and the Anthropocene", United Nations Development Programme (eISBN: 978-92-1-005516-1) 412 p.p http://hdr.undp.org/en/2020-report |
| **12** | **Websites:**<br>1. https://unfccc.int/<br>2. https://www.cbd.int/<br>3. https://cpcb.nic.in<br>4. https://mpcb.gov.in<br>5. https://www.iucnredlist.org/ |

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|---|---|---|---|
| **12** | **Internal Continuous Assessment: 40%** | **Semester End Examination: 60%** | |
| **13** | **Continuous Evaluation through:** | 1. Fieldwork-based project work and report or assignment or presentation or report-writing or article/ book review or topic-based activity | 10 Marks |
| | | 2. MCQ Based Test | 10 Marks |
| | | Total | 20 Marks |

**14** **Format of Question Paper:**

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | Attempt any THREE of the following: (From Module I) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| 2) | | Attempt any THREE of the following: (From Module II) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |

## Signatures of Team Members

| Sr. No. | Name | Signature |
|---|---|---|
| **1.** | Mr. Kaustubh Bhagat | |

# As Per NEP 2020

# Tolani College of Commerce (Autonomous)


## Title of the Course: Introduction to Bharatiya Gyan Parampara

**Name of the Programmes:**

1. Bachelor of Commerce (Taxation & Auditing)
2. Bachelor of Science (Data Science)
3. Bachelor of Science (Artificial Intelligence & Machine Learning)

## Semester I

**Syllabus for 2 Credit Course**

**From the academic year- 2026-2027**

# Name of the Course: Introduction to Bharatiya Gyan Parampara

| Sr. No. | Heading | Particulars |
|---|---|---|
| 1 | **Description of the course:** | The course is an introductory course to the Indian Knowledge System. The traditional and indigenous knowledge has been neglected for ages. The traditional Indian knowledge has strong scientific basis and can provide simplistic solutions to modern day problems. The course attempts to highlight the contribution of traditional Indian Knowledge System in different fields. |
| 2 | **Vertical:** | Indian Knowledge System |
| 3 | **Type:** | Theory |
| 4 | **Credit**: | 2 credits |
| 5 | **Hours Allotted:** | 30 Hours |
| 6 | **Marks Allotted**: | 50 Marks<br>Continuous Evaluation 20 Marks<br>Semester End Examination 30 Marks |
| 7 | **Course Objectives**:<br>By end of this course learners should be:<br>1. introduced to the rich heritage of Indian Knowledge System<br>2. able to appreciate the contribution of traditional Indian knowledge | |
| 8 | **Course Outcomes**:<br>The learners shall be able to:<br>1. understand the Indian contribution to the various fields of knowledge<br>2. appreciate the ability of the traditional knowledge systems to provide simplistic solutions modern day problem | |

| | |
|---|---|
| **9** | **Module 1: An Overview of Bharatiya Gyan Parampara (15 Hours)** |
| | 1. **Introduction to Knowledge Systems**- Definition; Need for Knowledge Systems; Knowledge Systems in nature; Different types of Knowledge Systems- European- Greek and Roman, Islamic, Asian- Oriental and Indian.<br>2. **British Education System and India**- Macaulay Education System- Concept, Origin, Need and Impacts; Bell model of Education (Madras Monitorial System)- Concept, History, Connection with Indian Education System, Impacts of Madras Monitorial System on British Education System;<br>3. **Indian Knowledge System**- Definition; Framework of Indian Knowledge System; Corpus of Indian Knowledge System- Vedic and Non-Vedic; Indigenous Indian Knowledge; Characteristics of Indian Knowledge System.<br>4. **Philosophical Systems in Indian Knowledge System**- Concept of Philosophy; Different Philosophical approaches in Indian Knowledge Systems- Saṃkhya and Yoga, Nyaya and Vaisesika, Purva-Mimamsa and Vedanta, Charvaka, Jainism and Budhhism |
| | **Module 2: Contribution of Indian Knowledge Systems (15 Hours)** |
| | 1. **Contribution in the fields of polity and management-** Concept of raj dharma, Arthashastra- King and Amtya, Janapadas, Administrative set up by Ashoka<br>2. **Contribution in the fields of science and mathematics-** Mathematics: Algebra, Geometry, Pingala and binary system; Science: Chemistry, Astronomy; Architecture: Traditional Indian houses, Temple architecture, Rock-cut, Cave architecture; Nature and conservation: Concept of *Panchmahabut*, Water conservation, Weather prediction, Concept of sacred groves<br>3. **Contributions in the fields of health and wellness-** Ayurveda: Concept of health, Sapta dhatvah, tridosa and tri gunas; Indian games: Types of Indian games (Indoor- Chess, Chausar, Snake and ladder and Outdoor- Kho-kho, Kabaddi, Logori, Langadi), Games as means to physical and mental well-being; Yoga: Concept, Schools of Yoga, 26 Principles of Yoga, Ashtanga Yoga; Home remedies for minor ailments<br>4. **Contribution in the fields of arts and Literature-** Clay moulding, Stone carving, Wood carving; Nava Rasas; Music and musical instruments; Natya shashtra; Folk art forms |
| **10** | **Reference Books:**<br>1. Binode Behari Dutt, Town planning in ancient India, Life Span Publishers & Distributors<br>2. Chopra Deepak, Perfect Health--Revised and Updated: The Complete Mind Body Guide, Harmony publication, 2001<br>3. Kak, S.C. (1987). "On Astronomy in Ancient India", Indian Journal of History of Science, 22(3), pp. 205–221.<br>4. Kapoor Kapil, Singh Avadhesh (2021). "Indian Knowledge Systems Vol – I & II", Indian Institute of Advanced Study, Shimla, H.P.<br>5. Mahadevan, B., Bhat Vinayak Rajat, Nagendra Pavana R.N. (2022), "Introduction to Indian Knowledge System: Concepts and Applications", PHI Learning Private Ltd. Delhi.<br>6. Patnaik Naveen The Garden of Life: An Introduction to The Healing Plants of India Doubleday (1 October 1993)<br>7. Prajananda Swami, Histroy of Indian Music, Ram Krishna vedanta math, Kolkata |
| **11** | **Websites:**<br>1. www.sacredland.org/sacred-groves-of-india/<br>2. www.cseindia.org/dte-supplement/forest20031231/sacred_disconnect.htm<br>3. https://iksindia.org/ |

| | | | |
|---|---|---|---|
| **12** | **Internal Continuous Assessment: 40%** | **Semester End Examination: 60%** | |
| **13** | **Continuous Evaluation through:** | 1. Fieldwork-based project work and report or assignment or presentation or report-writing or article/ book review or topic-based activity | 10 Marks |
| | | 2. MCQ Based Test | 10 Marks |
| | | Total | 20 Marks |

**14** **Format of Question Paper:**

| Question Number | | Nature of Questions | Maximum Marks |
|---|---|---|---|
| 1) | | Attempt any THREE of the following: (From Module I) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |
| 2) | | Attempt any THREE of the following: (From Module II) | 15 |
| | A. | | |
| | B. | | |
| | C. | | |
| | D. | | |

## Signatures of Team Members

| Sr. No. | Name | Signature |
|---|---|---|
| **1.** | Mr. Kaustubh Bhagat | |