**PROJECT TITLE**

*A Project Report submitted*

*to***MANIPAL ACADEMY OF HIGHER EDUCATION**

*for partial fulfilment of the requirement for*

*the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

**in**

**Data Science & Engineering**

*Submitted by*

**<Student Name>**

<Registration Number>

*Under the guidance of*

Name of the Internal Guide

Designation

Department

Manipal Institute of Technology

A screenshot of a cell phone

Description generated with very high confidence

**DEPARTMENT OF DATA SCIENCE & COMPUTER APPLICATIONS**

**<May/June/July> 2025DECLARATION**

I hereby declare that this project work entitled **<PROJECT TITLE>** is original and has been carried out by me in the Department of Data Science and Computer Applications of Manipal Institute of Technology, Manipal, under the guidance of **<Internal Guide Name and Designation including institute name>**. No part of this work has been submitted for the award of a degree or diploma either to this University or to any other Universities.

Place:

Date:

Full Name   
(paste your signature above the name)

**A screenshot of a cell phone

Description generated with very high confidence** **DEPARTMENT OF DATA SCIENCE & COMPUTER APPLICATIONS**

Manipal

< Date >

**CERTIFICATE**

This is to certify that the project titled <**PROJECT TITLE>** is a record of the bonafide work done by <**STUDENT NAME>** (*Reg. No. <Register No>*) submitted in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology (B.Tech.) in **DATA SCIENCE & ENGINEERING** of Manipal Institute of Technology, Manipal, Karnataka, during the academic year 2024-2025.

|  |  |
| --- | --- |
| **<Name of Internal Guide>**  *<Designation>* | **Dr. Radhika M. Pai**  *Professor & HOD, Department of Data Science & Computer Applications,  Manipal Institute of Technology, Manipal* |

**ACKNOWLEDGMENTS**

This section should contain the acknowledgements due to the Director, Dept HOD, Project supervisor, company personnel, department guide, Laboratory Incharge (where the work was carried out) and faculty members whose assistance was sought during the project work.

**ABSTRACT**

The abstract is brief synopsis of the project work and should be written in 4 paragraphs. The first paragraph should introduce the area of the topic and give importance of the work / topic in the present day scenario, hence leading to the objective of the project work. The second paragraph should briefly discuss the methodology that was adopted in the work. The third paragraph should discuss briefly the important results that were obtained and its significance. The fourth paragraph should discuss the important conclusion(s) of the project work. If you have used some software tools/packages or hardware/systems, indicate them in the last line. (The abstract should fit in one page only)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table of Contents** | | | | | |
|  | | | | | Page No |
| Acknowledgement | | | |  | i |
| Abstract | | | |  | ii |
| List Of Tables | | | |  |  |
| List Of Figures | | | |  |  |
|  | | | | | |
| **Chapter 1** | | | **INTRODUCTION** | | 1 |
|  | **1.1** | Introduction | | | 2 |
|  | **1.2** | Motivation | | |  |
|  | **1.3** |  | | |  |
|  | | | | | |
| **Chapter 2** | | | BACKGROUND THEORY and/or LITERATURE REVIEW | |  |
|  | **2.1** |  | | |  |
|  | **2.2** |  | | |  |
|  | | | | | |
| **Chapter 3** | | | **METHODOLOGY** | |  |
|  | **3.1** |  | | |  |
|  | **3.2** |  | | |  |
|  | | | | | |
| **Chapter 4** | | | **RESULT ANALYSIS** | |  |
|  | **4.1** |  | | |  |
|  | **4.2** |  | | |  |
|  | | | | | |
| **Chapter 5** | | | **CONCLUSION AND FUTURE SCOPE** | |  |
|  | **5.1** | Contribution summary (only for a group project - divide the work and list who is responsible for which part – **This is applicable for both internal and external projects**) | | |  |
|  | **5.2** |  | | |  |
|  | | | | | |
| **REFERENCES** | | | | |  |
| **ANNEXURES (OPTIONAL)** | | | | |  |
| **PLAGIARISM REPORT** | | | | |  |
| **PROJECT DETAILS** | | | | |  |

**LIST OF TABLES**

|  |  |  |
| --- | --- | --- |
| **Table No** | **Table Title** | **Page No** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **Figure No** | **Figure Title** | **Page No** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**CHAPTER 1**

**INTRODUCTION**

This chapter should include

* Introduction (1 paragraph brief of what is going to be discussed in this chapter)
* Introduction to the area of work (general discussion)
* Brief present day scenario with regard to the work area
* Motivation to do the project work
* *Shortcomings in the previous work / reference paper*
* *Brief importance of the work in the present context*
* *Uniqueness of the methodology that will be adopted*
* *Significance of the possible end result*
* Objective of the work
* *Main work objective*
* *Secondary objective if any*
* Target Specifications
* *Importance of the end result*
* Project Work schedule
* Organization of the project report (chapter wise)

**CHAPTER 2**

**BACKGROUND THEORY / LITERATURE REVIEW**

This chapter should include

* Introduction (1 paragraph brief of what is going to be discussed in this chapter)
* Introduction to the project title (specific discussion)
* Literature review
* *Present state / recent developments in the work area*
* *Brief background theory*
* *Literature Survey*
* Summarized outcome of the literature review
* Theoretical discussions
* General analysis
* Conclusions

**CHAPTER 3**

**METHODOLOGY**

This chapter should include

* Introduction (1 paragraph brief of what is going to be discussed in this chapter)
* Methodology
* Detailed methodology
* Assumptions made
* Design & Modelling, block diagrams
* Module specifications
* Justification for your modules
* Tools used
* Detailed specification / listing of the various components, measuring devices, software tool boxes, reference data sheets etc
* Preliminary result analysis if any
* Conclusions

**CHAPTER 4**

**RESULT ANALYSIS**

This chapter should include

* Introduction (1 paragraph brief of what is going to be discussed in this chapter)
* Result analysis
* Graphical / tabular form
* Explanation for the graphical / tabulated results
* Significance of the result obtained
* Any deviations from the expected results & its justification
* Conclusions

**CHAPTER 5**

**CONCLUSION AND FUTURE SCOPE**

This chapter should include

* Brief summary of the work
* Problem statement / objective, in brief
* Work methodology adopted, in brief
* Conclusions
* General conclusions
* Significance of the results obtained
* Future scope of work.

(At least three paragraphs, one for each suggestion has to be written.)

**REFERENCES**

*Journal / Conference Papers*

[1] Name 1 and Name 2, “Paper Title”, Full Journal Name, volume no, page numbers, year

[2] Name 1 and Name 2, “Paper Title”, Proceedings of the International / National Conference on \_\_\_, Institution, Country, page numbers, month, year

*Reference / Hand Books*

[1] Name 1, “Book Title”, Name of Publisher, Edition, ISBN number

*Web*

[1] Topic 1, website name, Last Accessed: <Date> (do not include long URL’s)

**CO AND PO MAPPING**

**REMOVE ALL THE TEXT WITH RED/BLUE FONT AFTER READING.**

**ALSO, DELETE THIS PAGE.**

**\*\*There are different Tables created according to the CATEGORY of projects related to Data Science and Engineering. The following are the categories defined:**

1. **Data Analytics/ Data Engineering**
2. **Software Engineering/ Web Development**
3. **Software and Hardware**
4. **Machine Learning/ Deep Learning/Artificial Intelligence**
5. **Humanities and Science**

**Choose the closest category to which your project work relates to and retain only that table.**

**CO AND PO MAPPING**

**\*\*Retain the below table if you project falls under the category of “Data Analytics / Data Engineering”. Otherwise, delete the table.**

Table A1.1 Course Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |  |
| DSE  4299.1 | Apply mathematical, statistical, and data engineering techniques to identify, formulate, synthesize and solve the problems from various areas of data science. | 2 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 |
| DSE  4299.2 | Gain proficiency in programming languages and techniques to develop and implement solutions that leverage data analytics, machine learning, and artificial intelligence. | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 1 |
| DSE  4299.3 | Utilize industry-standard tools to analyze, design, develop, deploy and test applications, integrating data science methodologies and software engineering principles. | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| DSE  4299.4 | Apply theoretical knowledge to real-world engineering problems and manage complex engineering projects. | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 |
| DSE  4299.5 | Acquire skills of collaboration and independent learning. | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 1 |
| **DSE 4299  (Avg. correlation level)** | | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **1.75** | **2.2** | **1.4** |

Table A1.2 Program Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** | **PSO3** |
| **DSE 4299** | **Project Work** | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **1.75** | **2.2** | **1.4** |

\*Kindly enter the average values from table A1.2 in the SHEET NAMED “NBA-CO-PO” of the following link.

<https://docs.google.com/spreadsheets/d/1RDuhlO5jxs-gX1XJbSVzDTjizMlS2CGuKMi7ms1Sex4/edit?usp=sharing>

\*Delete these lines (everything in red and blue font) during the report submission.

**CO AND PO MAPPING**

**\*\*Retain the below table if you project falls under the category of “Software Engineering/ Web Development”. Otherwise, delete the table.**

Table A1.1 Course Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |  |
| DSE  4299.1 | Apply mathematical, statistical, and data engineering techniques to identify, formulate, synthesize and solve the problems from various areas of data science. | 2 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| DSE  4299.2 | Gain proficiency in programming languages and techniques to develop and implement solutions that leverage data analytics, machine learning, and artificial intelligence. | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 1 |
| DSE  4299.3 | Utilize industry-standard tools to analyze, design, develop, deploy and test applications, integrating data science methodologies and software engineering principles. | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| DSE  4299.4 | Apply theoretical knowledge to real-world engineering problems and manage complex engineering projects. | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 |
| DSE  4299.5 | Acquire skills of collaboration and independent learning. | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 1 |
| **DSE 4299  (Avg. correlation level)** | | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **1.6** | **1.6** | **2.2** | **1.4** |

Table A1.2 Program Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** | **PSO3** |
| **DSE 4299** | **Project Work** | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **1.6** | **1.6** | **2.2** | **1.4** |

\*Kindly enter the average values from table A1.2 in the SHEET NAMED “NBA-CO-PO” of the following link.

<https://docs.google.com/spreadsheets/d/1RDuhlO5jxs-gX1XJbSVzDTjizMlS2CGuKMi7ms1Sex4/edit?usp=sharing>

\*Delete these lines (everything in red and blue font) during the report submission.

**CO AND PO MAPPING**

**\*\*Retain the below table if you project falls under the category of “Software and Hardware”. Otherwise, delete the table.**

Table A1.1 Course Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |  |
| DSE  4299.1 | Apply mathematical, statistical, and data engineering techniques to identify, formulate, synthesize and solve the problems from various areas of data science. | 2 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 |
| DSE  4299.2 | Gain proficiency in programming languages and techniques to develop and implement solutions that leverage data analytics, machine learning, and artificial intelligence. | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 1 |
| DSE  4299.3 | Utilize industry-standard tools to analyze, design, develop, deploy and test applications, integrating data science methodologies and software engineering principles. | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| DSE  4299.4 | Apply theoretical knowledge to real-world engineering problems and manage complex engineering projects. | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| DSE  4299.5 | Acquire skills of collaboration and independent learning. | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 1 |
| **DSE 4299  (Avg. correlation level)** | | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **2.2** | **2.2** | **1.4** |

Table A1.2 Program Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** | **PSO3** |
| **DSE 4299** | **Project Work** | **2.6** | **2.2** | **2.2** | **2.2** | **2.2** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **2.2** | **2.2** | **1.4** |

\*Kindly enter the average values from table A1.2 in the SHEET NAMED “NBA-CO-PO” of the following link.

<https://docs.google.com/spreadsheets/d/1RDuhlO5jxs-gX1XJbSVzDTjizMlS2CGuKMi7ms1Sex4/edit?usp=sharing>

\*Delete these lines (everything in red and blue font) during the report submission

**CO AND PO MAPPING**

**\*\*Retain the below table if you project falls under the category of “Machine Learning/ Deep Learning/Artificial Intelligence”. Otherwise, delete the table.**

Table A1.1 Course Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |  |
| DSE  4299.1 | Apply mathematical, statistical, and data engineering techniques to identify, formulate, synthesize and solve the problems from various areas of data science. | 2 | 3 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 |
| DSE  4299.2 | Gain proficiency in programming languages and techniques to develop and implement solutions that leverage data analytics, machine learning, and artificial intelligence. | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| DSE  4299.3 | Utilize industry-standard tools to analyze, design, develop, deploy and test applications, integrating data science methodologies and software engineering principles. | 3 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| DSE  4299.4 | Apply theoretical knowledge to real-world engineering problems and manage complex engineering projects. | 3 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 3 |
| DSE  4299.5 | Acquire skills of collaboration, teamwork and independent learning. | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 1 |
| **DSE 4299  (Avg. correlation level)** | | **2.6** | **2.2** | **2.2** | **3** | **3** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **1.3** | **2.2** | **2** |

Table A1.2 Program Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** | **PSO3** |
| **DSE 4299** | **Project Work** | **2.6** | **2.2** | **2.2** | **3** | **3** | **1** | **1** | **2** | **3** | **2** | **2** | **2.2** | **1.3** | **2.2** | **2** |

\*Kindly enter the average values from table A1.2 in the SHEET NAMED “NBA-CO-PO” of the following link.

<https://docs.google.com/spreadsheets/d/1RDuhlO5jxs-gX1XJbSVzDTjizMlS2CGuKMi7ms1Sex4/edit?usp=sharing>

\*Delete these lines (everything in red and blue font) during the report submission

**CO AND PO MAPPING**

**\*\*Retain the below table if you project falls under the category of “Humanities and Science”. Otherwise, delete the table.**

Table A1.1 Course Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |  |
| DSE  4299.1 | Apply mathematical, statistical, and data engineering techniques to identify, formulate, synthesize and solve the problems from various areas of data science. | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| DSE  4299.2 | Gain proficiency in programming languages and techniques to develop and implement solutions that leverage data analytics, machine learning, and artificial intelligence. | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| DSE  4299.3 | Utilize industry-standard tools to analyze, design, develop, deploy and test applications, integrating data science methodologies and software engineering principles. | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 |
| DSE  4299.4 | Apply theoretical knowledge to real-world engineering problems and manage complex engineering projects. | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 3 |
| DSE  4299.5 | Acquire skills of collaboration and independent learning. | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 2 |
| **DSE 4299  (Avg. correlation level)** | | **2.4** | **2** | **2.2** | **3** | **2** | **1** | **1** | **2.8** | **3** | **2** | **2** | **2.2** | **1.4** | **1.6** | **2.6** |

Table A1.2 Program Articulation Matrix

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PS02** | **PSO3** |
| **DSE 4299** | **Project Work** | **2.4** | **2** | **2.2** | **3** | **2** | **1** | **1** | **2.8** | **3** | **2** | **2** | **2.2** | **1.4** | **1.6** | **2.6** |

\*Kindly enter the average values from table A1.2 in the SHEET NAMED “NBA-CO-PO” of the following link.

<https://docs.google.com/spreadsheets/d/1RDuhlO5jxs-gX1XJbSVzDTjizMlS2CGuKMi7ms1Sex4/edit?usp=sharing>

\*Delete these lines (everything in red and blue font) during the report submission

**PROGRAM OUTCOMES (PO)**

Engineering Graduates will be able to:

**1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**4. Conduct investigations of complex problems:**Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**9. Individual and team work:**Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**12. Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAM SPECIFIC OUTCOMES (PSO)**

**PSO1**: Demonstrate the understanding of mathematical, statistical and AI techniques in the field of data science.

**PSO2:** Design and develop effective solutions using data analytics, visualization and artificial intelligence.

**PSO3:** Apply data science techniques in domains such as business, finance and health care.

**ANNEXURES (optional)**

Annexure to include

* Product Data sheets
* Design drawings
* Standard diagrams
* Lengthy codes/algorithms etc

**PLAGIARISM REPORT**

Include the plagiarism stats page of the Turnitin report.

Reports with plagiarism < 20% are only acceptable.

Contents to be checked for plagiarism: From Introduction to References.

PROJECT DETAILS

|  |  |  |  |
| --- | --- | --- | --- |
| *Student Details* | | | |
| **Student Name** |  | | |
| Register Number |  | Section / Roll No |  |
| Email Address |  | Phone No (M) |  |
| **Student Name** |  | | |
| Register Number |  | Section / Roll No |  |
| Email Address |  | Phone No (M) |  |
|  | | | |
| *Project Details* | | | |
| **Project Title** |  | | |
| Project Duration |  | Date of reporting |  |
|  |  | | |
| *Organization Details* | | | |
| **Organization Name** |  | | |
| Full postal address with pin code |  | | |
| Website address |  | | |
|  |  | | |
| *Supervisor Details* | | | |
| **Supervisor Name** |  | | |
| Designation |  | | |
| Full contact address with pin code |  | | |
| Email address |  | Phone No (M) |  |
|  |  | | |
| *Internal Guide Details* | | | |
| **Faculty Name** |  | | |
| Full contact address with pin code | Dept. of Data Science & Computer Applications, Manipal Institute of Technology, Manipal – 576 104 (Karnataka State), INDIA | | |
| Email address |  | | |

**General Guidelines (Delete this page when making the report submission)**

* Project Report to be minimum 20 pages. Reports less than 20 pages will be rejected.
* Project report to be maximum 50 - 60 pages (preferred)
* Paper Size: A4; Left = Right = Top = Bottom Margins = 1”
* Page Numbering Position: Bottom with right justified and continuous numbering from the Introduction Chapter
* Use Times New Roman Font with Normal Style, paragraph justified and 1.5 line spacing
* Paragraph Heading: Times New Roman Font, Bold, Font Size 14; Paragraph Matter: Times New Roman Font, Normal, Font Size 12;
* Sub-paragraphs be appropriately numbered as in 1.1, 1.2, 1.3 etc; Sub-paragraph Heading: Times New Roman Font, Italics, Font Size 12; Sub-paragraph Matter: Times New Roman Font, Normal, Font Size 12;
* Figure captions below Figure with chapter wise numbering
* Tables captions above Table with chapter wise numbering
* You are required to submit the SOFT COPY of the report to your internal guide.
* All references must be quoted in ascending order (follow IEEE format for referencing)
* Project Details page must be the last but one page in the project report
* **Arrangement of contents**
* [1] Cover page (same as an inner page)
* [2] Declaration (must be signed by the student)
* [3] Dedication (Optional)
* [4] Certificate (must be signed by Internal Guide and HOD)
* [5] Certificate on company letter head
* [6] Acknowledgement
* [7] Abstract
* [8] List of Tables
* [9] List of Figures
* [10] Table of contents
* [11] Chapters 1, 2, 3, 4, 5
* [12] References (follow IEEE format)
* [13] NBA mapping
* [13] Annexures (optional)
* [14] Project Details
* [15] Plagiarism Report (Similarity Index)
* The above guidelines should be used only as a help guide and is more or less a standard way of report writing
* Report formatting should not be disturbed in any form
* For any queries, student will contact their respective guide in the college.