RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 1/3

Branch	Computer Science and Engineering	Semester	6Th

Course Code		Course Name	Machine Learning And Deep Learning Using Python

Course Outcome 1	Understand the Fundamental Concepts of Machine Learning.	Teach Hrs (24)	Marks (30)
Learning Outcome 1	Explain the Basic Concepts of ML and its Applications.	06	10
Contents	**Introduction to machine learning:** ○ Definition. ○ Machine Learning & Human Learning. ○ Scope of Machine Learning. ○ Application of machine learning.		
Method of Assessment	Progressive Test- I (Internal)		
Learning Outcome 2	Differentiate Various Types of Learning in ML.	08	10
Contents	**Types of Machine Learning:** ○ Supervised Machine Learning. ○ Unsupervised Machine Learning. ○ Semi-supervised Machine Learning. ○ Reinforcement Machine Learning.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 3	Use Appropriate Python & R Libraries to Manage and Visualize ML Dataset.	10	10
Contents	**Python IDE and Dataset(s):** ○ Setup Python IDE (Jupyter, Pycharm, Google Colab (Online Platform), etc.). ○ Importing Libraries. ○ Reading Files (.csv, .xlsx, .pdf, Image, etc.). ○ Managing the Dataset. ○ Splitting Dataset into Training set and Test set. ○ Perform Data Visualization & Plotting Using R & Python.		

	Suggested Datasets: Kaggle, UCI ML Repository, OpenML, MNIST, etc.		
Method of Assessment	Practical (Internal)		
Course Outcome 2	**Apply Regression and classification Techniques in Machine learning.**	**(36)**	**(55)**
Learning Outcome 4	**Explain Regression and it's Various Types.**	08	10
Contents	**Concepts of Regression, Types and Metrics:** ○ Definition of Regression. ○ Linear Regression. ○ Polynomial Regression. ○ Logistic Regression. ○ Regression Metrics: Mean squared error, mean absolute deviation.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 5	**Use Linear Regression to Develop a Model For House Rent Prediction.**	08	10
Contents	**Implementation of Linear Regression:** ○ Load the Data (Kaggle Dataset OR Any Other Benchmark Dataset). ○ Explore the Data. ○ Predicting House Rent.		
Method of Assessment	Practical (External)		
Learning Outcome 6	**Differentiate Decision Tree and Random Forest Classifier.**	05	10
Contents	**Decision Tree and Random Forest Classifier:** ○ Define Classifier. ○ Introduction to Decision Tree. ○ Overview of Random Forest. ○ Advantage of Random Forest Over Decision Tree.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 7	**Describe Probabilistic Based Classification Technique.**	05	10
Contents	○ Conditional Probability. ○ Bayes Theorem. ○ Naive Bayes Classifier.		
Method of Assessment	Progressive Test-II (Internal)		

Learning Outcome 8	**Implement Support Vector Machine Classifier.**	10	10
Contents	**Classification, Regression and Outlier Detection: SVM** ○ Overview of Support Vector Machine. ○ SVM as Classification. ○ SVM as Regression.		
Method of Assessment	Practical (Internal)		
Course Outcome 3	**Evaluate Performance Measure of Machine Learning Models.**	**(15)**	**(20)**
Learning Outcome 9	**Define Various Performance Measure Metrics in ML.**	07	10
Contents	○ Classification Accuracy. ○ Confusion Matrix. ○ Precision and Recall. ○ Precision/Recall Trade-off. ○ F1- score. ○ ROC & AUC Curve.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 10	**Compute Model's Performance with Various Performance Metrics.**	08	10
Contents	○ Measuring Accuracy Using Cross-Validation. ○ Confusion Matrix. ○ Precision & Recall. ○ F1- score. ○ ROC & AUC.		
Method of Assessment	Practical (External)		
Course Outcome 4	**Understand the Basics of Deep Learning.**	**(30)**	**(50)**
Learning Outcome 11	**Discuss Deep Learning Concepts and it's Applications.**	05	10
Contents	**Introduction to deep learning:** ○ Definitions. ○ AI, ML and DL Correlation. ○ Application of Deep Learning. ○ Recent Trends in Deep Learning Architectures.		
Method of Assessment	Term Work (Internal)		

Learning Outcome 12	**Illustrate ANN, Perceptron and the Concept of Backpropagation.**	06	10
Contents	**Introduction to Artificial Neural Network:** ○ Definitions. ○ Biological Neurons. ○ Logical Computations with Neurons. ○ The Perceptron. ○ The Multilayer Perceptron and Backpropagation.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 13	**Discuss the Importance of Activation Function in ANN.**	06	10
Contents	○ Overview of Activation Function. ○ Type(s) of Activation Function: ■ Binary Step Function. ■ Linear Function. ■ Sigmoid Function. ■ ReLU & Leaky ReLU Function. ■ Exponential Function. ■ Softmax.		
Method of Assessment	Practical (External)		
Learning Outcome 14	**Explain Convolutional Neural Network.**	07	10
Contents	**Introduction to Convolutional Neural Network:** ○ Definitions of CNN. ○ Architecture(s) of CNN. ○ Overview of CNN Layers.		
Method of Assessment	End Sem Theory Exam (External)		
Learning Outcome 15	**Differentiate CNN and RNN.**	06	10
Contents	**Introduction to Recurrent Neural Network:** ○ Definitions of RNN. ○ Architecture of RNN. ○ Applications of RNN. ○ Overview of LSTM Networks.		
Method of Assessment	End Sem Theory Exam (External)		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				1	1	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO1)	**Understand the Fundamental Concepts of Machine Learning.**
LO Description (LO1)	**Explain the Basic Concepts of ML and its Applications.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Introduction to machine learning:** ○ Definition. ○ Machine Learning & Human Learning. ○ Scope of Machine Learning. ○ Application of machine learning.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	06	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Progressive Test- I	Students will be asked to Explain/ Differentiate/ Lists etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	0	4				1	2	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO1)	**Understand the Fundamental Concepts of Machine Learning.**
LO Description (LO2)	**Differentiate Various Types of Learning in ML.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Types of Machine Learning:** ○ Supervised Machine Learning. ○ Unsupervised Machine Learning. ○ Semi-supervised Machine Learning. ○ Reinforcement Machine Learning.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	08	00	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Explain/ Differentiate/ Lists etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				1	3	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO1)	**Understand the Fundamental Concepts of Machine Learning.**
LO Description (LO3)	**Use Appropriate Python & R Libraries to Manage and Visualize ML Dataset.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Python IDE and Dataset(s):** ○ Setup Python IDE (Jupyter, Pycharm, Google Colab (Online Platform), etc.). ○ Importing Libraries. ○ Reading Files (.csv, .xlsx, .pdf, Image, etc.). ○ Managing the Dataset. ○ Splitting Dataset into Training set and Test set. ○ Perform Data Visualization & Plotting Using R & Python. **Suggested Datasets:** Kaggle, UCI ML Repository, OpenML, MNIST, etc.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	–	10	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Question/ Test Paper/ Quiz Questions	External / Internal
1	Practical: Lab Assessment(File)	Students will be asked to write programs, demonstrate, explain, etc. in the lab and prepare lab files.	**10**	Lab File/ Question/ Test Paper/ Quiz Questions.	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				2	4	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO2)	**Apply Regression and classification Techniques in Machine learning.**
LO Description (LO4)	**Explain Regression and it's Various Types.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Concepts of Regression, Types and Metrics:** ○ Definition of Regression. ○ Linear Regression. ○ Polynomial Regression. ○ Logistic Regression. ○ Regression Metrics: Mean squared error, mean absolute deviation.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	08	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Explain/ Differentiate/ Lists etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

		Branch Code	Course Code	CO Code	LO Code	

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	4				2	5	Format No. **4**

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO2)	**Apply Regression and classification Techniques in Machine learning.**
LO Description (LO5)	**Use Linear Regression to Develop a Model For House Rent Prediction.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Implementation of Linear Regression:** ○ Load the Data (Kaggle Dataset OR Any Other Benchmark Dataset). ○ Explore the Data. ○ Predicting House Rent.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	–	08	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Practical: Lab Assessment	Students will be asked to write programs, demonstrate, explain, etc. in the lab and prepare lab files.	**10**	Lab File/ Question/ Test Paper/ Quiz Questions.	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				2	6	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO2)	**Apply Regression and classification Techniques in Machine learning.**
LO Description (LO6)	**Differentiate Decision Tree and Random Forest Classifier.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Decision Tree and Random Forest Classifier:** ○ Define Classifier. ○ Introduction to Decision Tree. ○ Overview of Random Forest. ○ Advantage of Random Forest Over Decision Tree.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	05	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Explain/ Differentiate/ Advantages and Disadvantages based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

		Branch Code	Course Code	CO Code	LO Code	

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	4				2	7	Format No. 4

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO2)	**Apply Regression and classification Techniques in Machine learning.**
LO Description (LO7)	**Describe Probabilistic Based Classification Technique.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	○ Conditional Probability. ○ Bayes Theorem. ○ Naive Bayes Classifier.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	05	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Progressive Test-II	Students will be asked to Solve/ Explain/ Differentiate/ Prove etc. Based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				2	8	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO2)	**Apply Regression and classification Techniques in Machine learning.**
LO Description (LO8)	**Implement Support Vector Machine Classifier.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Classification, Regression and Outlier Detection: SVM** ○ Overview of Support Vector Machine. ○ SVM as Classification. ○ SVM as Regression.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	–	10	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Practical: Lab Assessment	Students will be asked to write programs, demonstrate, explain, etc. in the lab and prepare lab files.	**10**	Lab File/ Question/ Test Paper/ Quiz Questions.	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				3	9	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO3)	**Evaluate Performance Measure of Machine Learning Models.**
LO Description (LO9)	**Define Various Performance Measure Metrics in ML.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	○ Classification Accuracy. ○ Confusion Matrix. ○ Precision and Recall. ○ Precision/Recall Trade-off. ○ F1- score. ○ ROC & AUC Curve.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	07	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Explain/ Differentiate/ Lists etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				3	10	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO3)	**Evaluate Performance Measure of Machine Learning Models.**
LO Description (LO10)	**Compute Model's Performance with Various Performance Metrics.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	○ Measuring Accuracy Using Cross-Validation. ○ Confusion Matrix. ○ Precision & Recall. ○ F1- score. ○ ROC & AUC.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	–	08	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Practical: Lab Assessment	Students will be asked to write programs, demonstrate, explain, etc. in the lab and prepare lab files.	**10**	Lab File/ Question/ Test Paper/ Quiz Questions.	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				4	11	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO4)	**Understand the Basics of Deep Learning.**
LO Description (LO11)	**Discuss Deep Learning Concepts and it's Applications.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Introduction to deep learning:** ○ Definitions. ○ AI, ML and DL Correlation. ○ Application of Deep Learning. ○ Recent Trends in Deep Learning Architectures.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	05	8	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Term Work: Assignment	Students will be asked to Submit Assignments before the deadline for Assignment Questions.	**10**	Question/ Test Paper/ Quiz Questions	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				4	12	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO4)	**Understand the Basics of Deep Learning.**
LO Description (LO12)	**Illustrate ANN, Perceptron and the Concept of Backpropagation.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Introduction to Artificial Neural Network:** ○ Definitions. ○ Biological Neurons. ○ Logical Computations with Neurons. ○ The Perceptron. ○ The Multilayer Perceptron and Backpropagation.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	06	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Illustrate/ Explain/ Differentiate etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				4	13	

COURSE NAME	Machine Learning And Deep Learning Using Python
CO Description (CO4)	Understand the Basics of Deep Learning.
LO Description (LO13)	Discuss the Importance of Activation Function in ANN.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	○ Overview of Activation Function. ○ Type(s) of Activation Function: ■ Binary Step Function. ■ Linear Function. ■ Sigmoid Function. ■ ReLU & Leaky ReLU Function. ■ Exponential Function. ■ Softmax.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	–	06	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Practical: Lab Assessment	Students will be asked to write programs, demonstrate, explain, etc. in the lab and prepare lab files.	**10**	Lab File/ Question/ Test Paper/ Quiz Questions.	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				4	14	

COURSE NAME	Machine Learning And Deep Learning Using Python

CO Description (CO4)	**Understand the Basics of Deep Learning.**
LO Description (LO14)	**Explain Convolutional Neural Network.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Introduction to Convolutional Neural Network:** ○ Definitions of CNN. ○ Architecture(s) of CNN. ○ Overview of CNN Layers.	Traditional lecture method + Handouts + Assignments + Videos + Quiz.	Teacher will explain the contents and provide handouts. Teacher will conduct quiz to make students practice their knowledge.	07	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Illustrate/ Explain/ Differentiate etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				4	15	

COURSE NAME	**Machine Learning And Deep Learning Using Python**
CO Description (CO4)	**Understand the Basics of Deep Learning.**
LO Description (LO15)	**Differentiate CNN and RNN.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Introduction to Recurrent Neural Network:** ○ Definitions of RNN. ○ Architecture of RNN. ○ Applications of RNN. ○ Overview of LSTM Networks.	Lab practicals with traditional lecture method and handouts	Teacher will explain the contents and provide handouts. Students will program it in the lab	06	–	Handout/ Chalk-Board / Paper-Pen / Videos / PPT/ E-contents.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	End Sem Theory Exam	Students will be asked to Illustrate/ Explain/ Differentiate/ Lists etc. based on Contents.	**10**	Question/ Test Paper/ Quiz Questions	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Student(s) can Pick the Following Topic(s) for Micro/Major Project:

Prerequisite:

- Experiment with ML open source development environment (Google Colab, etc.)
- Importing and summarizing the various available datasets (Kaggle, UCI ML repository, OpenML)
- Managing the dataset (Missing data, encoding categorical data, one hot encoder)
- Splitting dataset into training and test test
- Perform Data visualization
- Feature scaling

Project Topic:
-Building an ANN model
-House rate estimation
-Loan prediction projects
-Building a CNN Model
-Handwritten digit classification
-Cat dog classification
-Breast Cancer/Tumours detection
-MNIST (Fashion) classification
-Object detection/ Face recognition
-Saving the model