



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

M. Tech CSE (DATA SCIENCE)/ DATA SCIENCE

SEMESTER- III (2025-27)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTCSDS301	DCC	Social Media Analytics	60	20	20	30	20	3	0	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. Equip students with fundamental knowledge of social media analytics.
2. Enable learners to interpret, analyze, and utilize social media data effectively.
3. Familiarize students with key tools and techniques for analyzing social media performance.
4. Develop practical skills for tracking online consumer behavior and digital campaign success.
5. Encourage strategic decision-making through data-driven insights from social platforms

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. Understand the importance and application of social media analytics in modern business contexts.
2. Gain hands-on experience with analytics tools and metrics.
3. Develop strategies for optimizing social media campaigns based on data analysis.
4. Interpret consumer behavior and engagement trends using analytical techniques.
5. Create actionable reports to enhance brand presence and ROI

SYLLABUS

UNIT I

9 HOURS

Introduction to Social Media Analytics: Basics of social media platforms and their significance. Overview of social media analytics: scope and importance. Types of data: structured, unstructured, and semi-structured. Ethical considerations and privacy concerns social media analytics.

UNIT II

9 HOURS

Data Collection and Visualization: Data scraping and APIs for social media platforms. Tools for data collection: Google Analytics, Hootsuite, etc. Visualizing data: Dashboards, charts, and graphs. Understanding key performance indicators (KPIs) for social platforms.

UNIT III

9 HOURS

Analytical Techniques and Tools: Sentiment analysis and natural language processing. Social network analysis (SNA), Predictive analytics for social trends, Tools: Tableau, Power BI, Netlytic

UNIT IV

9 HOURS

Campaign Monitoring and Optimization: Measuring campaign effectiveness: reach, engagement, impressions.

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A/B testing and experimentation in social media campaigns. Competitive analysis on social media platforms. Case studies of successful and failed campaigns.

UNIT V

9 HOURS

Advanced Topics and Future Trends: Social media listening and brand reputation management, Impact of artificial intelligence and machine learning, Predictive models for viral content, Future of analytics: AR/VR, Metaverse, and beyond.

TEXTBOOKS:

1. "Social Media Analytics: Techniques and Insights for Extracting Business Value Out of Social Media" by Matthew Ganis & Avinash Kohirkar.

REFERENCE:

1. "Advanced Analytics and AI" by Tony Boobier.
2. "Analyzing Social Media Networks with NodeXL" by Derek Hansen, Ben Shneiderman, and Marc A. Smith.
3. "Big Data and Social Science: Data Science Methods and Tools" by Ian Foster et al.

LIST OF PRACTICALS

1. Perform sentiment analysis on Twitter data using Python or R.
2. Track and analyze engagement metrics for a brand's Instagram campaign.
3. Examine audience demographics (age, location, etc.) for a specific brand page on Facebook or Instagram Insights.
4. Study how engagement metrics change based on the time posts are published.
5. Identify trending keywords in a domain using tools like Google Trends or basic Excel functions.

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MTCSDS302	DCC	Deep Learning	60	20	20	30	20	3	0	2	4

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COURSE OBJECTIVES:

The student will have the ability to:

1. Introduce the idea of artificial neural networks and their architecture
2. Introduce techniques used for training artificial neural networks
3. Enable the design of an artificial neural network for the classification
4. Enable design and deployment of deep learning models for machine learning problems

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. Able to understand the mathematics behind the functioning of artificial neural networks
2. Able to analyze the given dataset for designing a neural network-based solution
3. Able to carry out the design and implementation of deep learning models for signal/image processing applications
4. Able to design and deploy simple TensorFlow-based deep learning solutions to classification problems

SYLLABUS

UNIT I

9 HOURS

Introduction: Basics of Artificial Intelligence, Machine Learning, and Deep Learning, Overview of Neural Networks, Anatomy of Neural Network: Layers, Weights, biases. Activation Functions, Forward Propagation, Backward Propagation, Gradient Descent. Overfitting vs Underfitting, Regularization

UNIT II

9 HOURS

Deep Neural Networks: Architectures, Optimization Techniques: Learning rate scheduling, momentum, and Adam optimizer. Convolutional Neural Networks, convolution, pooling, Applications in image recognition and computer vision.

UNIT III

9 HOURS

CNN Architectures: Transfer learning, AlexNet, GoogleNet, ResNet, SqueezeNet, InceptionNet, DenseNet, and VGGNet Applications in image classification

UNIT IV

9 HOURS

Sequence Modelling: RNN, LSTM, Object Detection, R-CNN, Faster-RCNN, Yolo, Mask RCNN

UNIT V

9 HOURS

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GenAI: Auto Encoder-Decoders, Transformer, BERT, GAN, LLM

TEXTBOOKS:

1. Ian Goodfellow, Yoshua Bengio and Aaron Courville, “Deep Learning”, MIT Press, 2016
2. Nikhil Buduma, “Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithm”, O’Reilly, 2017.

REFERENCE:

1. Nikhil Ketkar, “Deep Learning with Python: A Hands-on Introduction”, Apress, 2017.
2. V Lakshamanan, M, Gorner, R. Gillard, “Practical Machine Learning for Computer Vision”, Oreilly

LIST OF PRACTICALS

1. Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets. Vary the activation functions used and compare the results.
2. Build a Deep Feed Forward ANN by implementing the Backpropagation algorithm and test the same using appropriate data sets. Use the number of hidden layers ≥ 4 .
3. Design and implement an Image classification model to classify a dataset of images using Deep Feed Forward NN. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.
4. Design and implement a CNN model (with 2 layers of convolutions) to classify multi category image datasets. Record the accuracy corresponding to the number of epochs. Use the MNIST, CIFAR-10 datasets.
5. Use the concept of Data Augmentation to increase the data size from a single image.
6. Design and implement a CNN model to classify CIFAR10 image dataset. Use the concept of Data Augmentation while designing the CNN model. Record the accuracy corresponding to the number of epochs.
7. Implement the standard LeNet-5 CNN architecture model to classify multicategory image dataset (MNIST, Fashion MNIST) and check the accuracy
8. Implement the standard VGG-16 & 19 CNN architecture model to classify multi category image dataset and check the accuracy.
9. Implement RNN for sentiment analysis on movie reviews.
10. Implement Bidirectional LSTM for sentiment analysis on movie reviews.

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