गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
कोनी, बिलासपुर – 495009 (छ.ग.)

Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur – 495009 (C.G.)

List of New Course(s) Introduced

Department	**: *Computer Science and Information Technology***
Programme Name	**: *MCA***

Academic Year : 2020-21

List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
	MCA-301	Machine Learning
	MCA-204(Elective-III)-(3)	Neural networks and Deep Learning
	MCA-304(Elective-V)-(3)	Data Science using Python

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Department of CSIT, GGV, Bilaspur, C.G

Minutes of the Meeting of Board of Studies

The Board of Studies meeting for curriculum structure / syllabus design of M.C.A 2 Year degree course was held on **04/07/2020 at 3:00 PM** through online mode. Following B.O.S members were present in the meeting

1. Prof. R.S. Jadon, External Member of B.O.S
2. Prof. A.K.Saxena, Chairman, B.OS
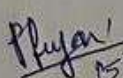3. Dr. Rajwant Singh Rao, Internal Member of B.O.S

Following are the resolution of the meeting

1. The enclosed scheme of Curriculum structure / Syllabus for MCA 2 Year degree course is designed as per the latest requirement. The contents of each paper will be supplied through Head of the department, CSIT.
2. Bridge course (non credit course) for non IT back ground students is included in the curriculum structure / syllabus.
3. The curriculum structure / syllabus of MCA 2 year degree course is recommended from the academic session 2020-21.

(Prof. R.S.Jadon)
e-mail consent attached
Meeting held online

(Prof. A.K.Saxena)

(Dr. R. S. Rao)

15/07/2020

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[Syllabus for MCA 2 Year Degree Course, Effective from the session 2020-21]

Department of Computer Science & Information Technology
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
SYLLABUS FOR MCA 2 YEAR DEGREE COURSE

Effective from Session 2020-21

Semester 3

Sl.no	Subject Code	Title	Credit		Marks		Credits
			L	P	Internal	External	
1	MCA-301	Machine Learning	4		40	60	4
2	MCA-302	Computer Graphics and Multimedia	4		40	60	4
3	MCA-303	Data Mining and Data Warehousing	4		40	60	4
4	MCA-304	Elective V	4		40	60	4
5	MCA-305	Elective VI	4		40	60	4
6	MCA-306	Lab based on V / VI		2			2
7	MCA-307	Minor Project		2		100	2
		Total	20	04	200	500	26

Semester 4

Sl.no	Subject Code	Title	Credit		Marks		Credits
			L	P	Internal	External	
1	MCA-401	Major Project	-	-	-	500	22
		Total	-	-	-	-	22

Electives

Sl.No	Paper Code	(1)	(2)	(3)
1	MCA-104(Elective-I)	Advanced JAVA Programming	Probability and Statistics	Linux Operating System and Shell Programming
2	MCA-105(Elective-II)	Computer Network	Mobile Application Programming	V.B.Net Programming
3	MCA-204(Elective-III)	E-Commerce	Cloud Computing	Neural networks and Deep Learning
4	MCA-205(Elective-IV)	Web Technology	Image Processing	Pattern Recognition
5	MCA-304(Elective-V)	Big Data Analytics	Advanced Operating System	Data Science using Python
6	MCA-305(Elective-VI)	Compiler Design	Network Security	Parallel processing

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[Syllabus for MCA 2 Year Degree Course, Effective from the session 2020-21]

MCA-204   ELECTIVE-III   (3)

Neural Networks and Deep Learning

1. Introduction to biological neuron, artificial neuron, biological neuron vs. artificial neuron, evolution of neural networks, basic models of artificial neural networks(ANN) : connections, learning :- supervised, unsupervised, reinforcement, activation functions, important terminology of ANN. McCulloh-Pitts neuron, linear separability, types of neural networks.

2. Perceptron Networks, implementation of AND gate, OR gate, NAND gate etc., Gradient descent algorithm, implementation of AND gate, OR gate, NAND gate etc., Building a neural controller for obstacle avoidance, Pseudo inverse solution, nonlinear separability, Back propagation(BP) networks, Derivation of BP algorithm for single hidden layer architecture, momentum terms,   implementation of XOR problem using BP algorithm.

3. Radial basis function neural network (RBFNN): architecture, training algorithm, Recurrent neural network(RNN) : architecture, training algorithm, Back propagation through time (BPTT). Real time recurrent learning algorithm(RTRL), Functional link artificial neural networks (FLANN): architecture, training, delta learning rule, Extreme Learning Machine(ELM): architecture, learning algorithm, Modified multilayer neural network, modified Back propagation (BP) algorithm, Self organizing map(SOP)

4. Deep Learning : Introduction, Long short term memory(LSTM) network, Convolution neural network, Boltzman Machine network.

5. Applications: function optimization, classification, prediction, detection

Readings:

1. Neural Networks and Learning machines by Simon Haykin, PHI, 3rd Edition
2. Neural Network Design by M. Hagan, 2nd Edition, eBook
3. Principles of Soft Computing by S. N. Shivanandam and S. N. Deepa, Wiley, 2nd Edition
4. Artificial neural networks by B. Yegnanarayana, PHI.
5. Deep Learning by John D. Kelleher, MIT Press.
6. Neural networks and Deep learning by Charu C. Aggarwal, Springer, 1st Edition, 2018.
7. Research papers

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[Syllabus for MCA 2 Year Degree Course, Effective from the session 2020-21]

MCA-303

Data Mining and Data Warehousing

1. **Data Mining:** Meaning, necessity, steps, Normal searching Vs. knowledge extraction

2. **Data Mining on different types of databases:** Relational, Data Warehouses, Transactional, Object oriented, Object relational, Spatial, Temporal and time series, Text and multimedia, Heterogeneous and legacy.

3. **Data Warehouse:** Meaning, definition, OLTP Vs. OLAP, Data cube, star schema, snow flake schema, fact constellations, basic concepts in writing of DMQL, Three Tier Architecture of data warehouse, data mart, Indexing.

4. **Data Preprocessing :** Data cleaning, Data integration, Chi-square test, Data transformation, Data reduction, Dimensionality reduction : Principal component analysis (PCA), factor analysis (FA), Data compression : discrete Fourier Transform(DFT), discrete cosine transform (DCT), discrete Wavelet transform(DWT)

5. **Classification, Clustering and Prediction:** Meaning, k-nearest neighbourhood (k-NN), Neural network based classification, Support vector machine(SVM) classifier, Naïve Bayes classifier. Clustering : types of variables, distance measures, types of Clustering, Partioning Method: k-means, k-medoid clustering, Unsupervised : Hierarchical clustering, Prediction using Regression, nonlinear regression and Neural Network, Performance Measures. Types of training: holdout method, cross validation, leave-one-out method.

6. **Association rule mining:** Market basket analysis, support, confidence, Apriori algorithm

Readings:

1. Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishes (Elsevier, 2nd edition), 2006
2. Data Mining Methods for Knowledge Discovery, Cios, Pedrycz, Swiniarski,Kluwer Academic Publishers, London – 1998.

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