

**Name of the Course:** **Machine Learning & Deep Learning**

**Name of Instructor:** Dr Sandeep Chaurasia & Dr Mahesh Jangid

**Language of Instruction:** English

**Number of Contact Hours:** 36

**Credit Awarded:** 03

<b>Objective of course:</b>	<ul style="list-style-type: none"> <li>• Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.</li> <li>• Understand the strengths and weaknesses of many popular machine learning approaches.</li> <li>• Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.</li> <li>• Be able to design and implement various machine learning algorithms in a range of real-world applications.</li> </ul>
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### Syllabus

Machine Learning – Introduction, Use of ML, Types of ML, Challenges of ML, Machine learning on Real Data, Linear Regression, Gradient Decent, Polynomial Regression, Regularization & Logistic Regression, Artificial Neural Network, Multilayer Perceptron & Backpropagation. Naïve Bayes, Support Vector Machine, Deep Learning – Introduction, Convolutional Neural Network, Convolution layer, Pooling Layer, Dense Layer, Recurrent Neural Network, LSTM, GRU, Transfer learning and fine-tuning

### Organization of the Course:

<b>Total contact hrs 36</b>		
<b>1st week:</b>	<b>18 hrs (classes)</b>	<b>2 hrs (self-study/project) (Mid term exam/assessment/discussion)</b>
<b>2nd week:</b>	<b>18 hrs (classes)</b>	<b>2 hrs (End term exam)</b>

**Mode of lectures:** online lecture/online videos/case study/ discussion/ workshop/ hands-on

**Course Plan:**

Lecture no.	Topic	Lecture mode	Instructor
L: 1- 4	Machine Learning – Introduction Use of ML, Types of ML Challenges of ML Machine learning on Real Data	Online with Hands-on	Dr Sandeep Chaurasia
L: 5–10	Linear Regression Gradient Decent Polynomial Regression Regularization & Logistic Regression	Online with Hands-on	Dr Sandeep Chaurasia
L: 11 – 16	Artificial Neural Network - Multilayer Perceptron & Backpropagation.	Online with Hands-on	Dr Sandeep Chaurasia
L: 17 – 22	Naïve Bayes Support Vector Machine	Online with Hands-on	Dr Sandeep Chaurasia
L: 22 - 24	Deep Learning – Introduction	Online with Hands-on	Dr. Mahesh Jangid
L: 25-30	Convolutional Neural Network -Convolution layer -Pooling Layer -Dense Layer	Online with Hands-on	Dr. Mahesh Jangid
L: 31-33	Recurrent Neural Network -LSTM -GRU	Online with Hands-on	Dr. Mahesh Jangid
L: 34-36	Transfer learning and fine-tuning	Online with Hands-on	Dr. Mahesh Jangid

**Course Instructors:**  
**Dr Sandeep Chaurasia**



Dr. Sandeep Chaurasia is working as Professor in the department of CSE, School of Computing & I.T. in Manipal University Jaipur. He has more than 12 years of rich experience in academics and one year in industry. He has more than more than 30 publications in International / national journals/conference proceedings. He is a SMIEEE, LMCSI, MACM and member of Machine Intelligence Research labs - USA. He is also member of reviewer board of various journals and technical program committee of several reputed conferences. His research interests include Machine Learning and Soft Computing, and other areas of interest are Algorithms, Artificial Intelligence. He is associated with Machine Learning for more than 7 years. Currently working in the area of application of machine / Deep learning in natural language processing like semantic analysis & lexical analysis. Currently he is guiding 4 PhD students in the area of NLP, Intrusion detection, food adulteration using AI techniques. He is also active member of special interest group and initiative by MIR labs to connect the researchers & professional across the globe.

**Dr. Mahesh Jangid**



Dr. Mahesh Jangid is Associate in Department of Computer Science & Engineering, Manipal University Jaipur, having 10 years of teaching and Research experience with prestigious academic institutions. He has an impeccable academic record and keen interest in research. He is GATE, SET and NET qualified. He has completed his Engineering from Rajasthan University in 2007 and his masters (M.Tech) from Dr B. R. Ambedkar National Institute of Technology, Jalandhar in 2011. He has completed his Ph.D. from Manipal University Jaipur. The objective of his research is to use Deep learning approaches in computer vision field and document analysis & recognition. His research interests include machine learning, soft computing, pattern recognition and image processing. He has conducted a 15-day summer programme on “Neural network and its applications” in association with University of Applied Science, Switzerland at the Ngee Ann Polytechnic, Singapore. He is an IEEE senior member and actively involved in IEEE activities. Apart from that he is also an active members of various globe societies like CSTA-ACM, IEEE-Computer Society, UACEE and IAENG. He has guided Bachelor and master’s degree students in the field of Deep Learning and Digital Image Processing. He has published and presented more than 30 research papers in the peer reviewed journals and International Conferences in India, USA, and Thailand. He is also member of reviewer board of various journals and technical program committee of several reputed conferences.