	National Institute of Technology Meghalaya An Institute of National Importance		CURRICULUM
Programme	**Bachelor of Technology in Computer Science and Engineering**	Academic Year of Regulation	**2018-19**
Department	**Computer Science and Engineering**	Semester	**VII**

Course Code	Course Name	Credit Structure				Marks Distribution		
		L	T	P	C	Continuous Evaluation	Lab Test/ Viva	Total
CS461	**Computational Intelligence Lab**	**0**	**1**	**2**	**2**	**70**	**30**	**100**

Course Objectives		Course Outcomes		
	To introduce about current computational intelligence techniques		CO1	**Able to understand different computational techniques**
	To impalement computational techniques for different types of data		CO2	**Able to apply different computational techniques in different domains**
	To analyze the performance of computational techniques for different applications		CO3	**Able to analyze the performance of different computational techniques**

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**
2	CO2	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**
3	CO3	**1**	**1**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**

SYLLABUS

No.	Content	Hours	COs
I	Getting familiar with Python Programming and its different packages	**02**	**CO1 CO2 CO3**
II	Implementation and analysis of ANN for Numeric data	**02**	
III	Implementation and analysis of CNN and RNN.	**04**	
IV	Implementation and analysis of GAN, LSTM and its variants.	**04**	
V	Text data processing using ANN, CNN, LSTM and its variants.	**04**	
VI	Hands-on on Hadoop and file management	**04**	
VII	Data stream processing on Apache Spark	**04**	
	To be done necessarily as mini-project group-wise in groups of at least two/three students. **Note:- The topics and experiments need to be updated as per the current industry trends and upcoming new techniques.**		
	Total Hours	**24**	

Essential Readings

1. C.C. Aggarwal, and C. Zhai. “Mining text data”, 1st edition, Springer, 2012.
2. A, Gulli, and A Kapoor, “TensorFlow 1.x Deep Learning Cookbook”, 1st Edition, Packt Publishing, 2017
3. T White, “Hadoop: The Definitive Guide”, 4th Edition, O’Reilly, 2015.

Supplementary Readings

1. J. Dean. “Big Data, Data Mining, and Machine Learning: Value Creation for Business Leaders and Practitioners”, 1st edition, John Wiley & Sons, 2014.
2. Ian Goodfellow, Yoshua Bengio, Aaron Courville, “Deep Learning”, 1st Edition, MIT Press, 2016
3. D Dev, “Deep Learning with Hadoop”, 1st Edition, Packt Publishing, 2017