Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NCED511	Hydroclimatology	3	0	0	3

Course Objective

The course aims to impart an understanding of the hydroclimatic challenges and some techniques to analyze them.

Learning Outcomes

Upon successful completion of this course, the students should be able to:

- understand the connections between hydrology and climate
- develop basic hydroclimatic models
- understand the contemporary issues related to climate change

Unit No.	Topics to be Covered	Lectures	Learning Outcome
1	**Introduction to Hydroclimatology:** Hydrology and climate connection: temporal and spatial scales, teleconnections	[7]	To understand the temporal and spatial connections between hydrology and climate
2	**Hydroclimatic modeling:** Approaches, preprocessing, products, performance evaluation	[10]	To know the traditional and upcoming methods of hydroclimatic modeling
3	**Statistical modelling:** concepts, predictors, introduction to common statistical methods (eg., MLR, PCA)	[10]	To develop and evaluate statistical hydroclimatic models
4	**Dynamical modelling:** concepts, GCMs, downscaling, bias correction, RCMs	[8]	To know the basis of dynamic models and learn to handle GCM products
5	**Climate change:** evidences, future climate scenarios, impacts on water resources, case studies	[7]	To know about the contemporary global issues related to climate change and its impact on water resources
	ToTal	42	

Text Books:

1. Raju, K. S., & Kumar, N.D. (2018). Impact of Climate Change on Water Resources.
2. Karamouz, M., Nazif, S., and Falahi, M. (2012). Hydrology and hydroclimatology: principles and applications. CRC Press.
3. Maity, R. (2018). Statistical methods in hydrology and hydroclimatology (Vol. 585). Springer.

Reference Books:

1. Wilks, D. S. (2011). Statistical methods in the atmospheric sciences (Vol. 100). Academic press.
2. Shelton, M. L. (2009). Hydroclimatology: perspectives and applications. Cambridge University Press.