	National University of Sciences and Technology
	Course Description

Course Title	Course Code	Credit Hours
Deep Learning for Solid Mechanics Applications	ME-880	3 – 0

Textbook:
- Deep Learning for the Life Sciences: Applying Deep Learning to Genomics, Microscopy, Drug Discovery, and More" by Bharath Ramsundar and Peter Eastman

Reference Books:
- Machine Learning and AI for Healthcare: Big Data for Improved Health Outcomes" by Arjun Panesar and Himanshu Bhatt
- Deep Learning for Computer Vision: Expert techniques to train advanced neural networks using TensorFlow and Keras" by Rajalingappaa Shanmugamani

Course Objective:
- To introduce the fundamental concepts, tools , methods and techniques of deep learning for solid mechanics applications

Course Outline:
- Introduction to Deep Learning for Solid Mechanics Applications
- Overview of deep learning and its applications
- Introduction to mechanics of materials and structural mechanics
- Advantages of deep learning in solid mechanics
- Fundamentals of Deep Learning
- Neural network architecture
- Activation functions and loss functions
- Training and optimization
- Evaluation and performance metrics
- Applications of Deep Learning in Solid Mechanics
- Modeling of mechanical systems using deep learning
- Simulation of solid mechanics problems with deep learning
- Optimization of structures using deep learning
- Control of mechanical systems using deep learning
- Hands-On Experience with Deep Learning Tools for Solid Mechanics
- Applications: Implementing deep learning models using Python and TensorFlow
- Data preparation and preprocessing
- Model training and validation
- Model evaluation and performance analysis

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%