

## SE553: Structural Optimization

Teaching Scheme			Credits	Marks Distribution				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE	CE	ESE	CE	
3	2	0	5	70	30	30	20	150

### Course Content:

Sr. No	Topics	Teaching Hrs.
1	<p><b><u>Introduction:</u></b></p> <p>Introduction to optimization, optimization techniques for unconstrained and constrained optimization problems.</p>	08
2	<p><b><u>Classical Optimization Technique:</u></b></p> <p>Classical Optimization, Lagrange Multiplier technique and Kuhn Tucker conditions, Linear Programming and Simplex Algorithm.</p>	08
3	<p><b><u>NL Programming:</u></b></p> <p>Solution of NLP by direct methods and by series of unconstrained optimization problems, formulation of different types of structural optimization problems.</p>	08
4	<p><b><u>Computational Technique:</u></b></p> <p>Computation of derivatives of response quantities with respect to design variables</p>	08
5	<p><b><u>Structural Optimization :</u></b></p> <p>Minimum weight design of trusses, frame, etc.</p>	08
6	<p><b><u>Special Topics:</u></b></p> <p>Introduction Genetic Algorithm</p>	02
<b>Total Hrs.</b>		<b>42</b>

### Reference Books:

1. S. S. Rao, "Engineering *Optimization: theory & Practice*", John Wiley & Sons.
2. K. I. Majid, "*Structural Optimization*", John Wiley & Sons.

3. E. Kresysig, "*Advanced Engineering Mathematics*", John Wiley & Sons.
4. W. R. Spiller and K. M. Macbain, "*Structural Optimization*", Springer.
5. A. J. Morris, "*Foundation of structural optimization-A unified approach*", John Wiley & Sons.
6. L. Spunt, "*Optimum Structural Design*", Prentice-Hall Inc.
7. Uri Krisch, "*Optimum Structural Design: concepts, methods, and applications*", McGraw-Hill.