

## Lesson Plan

Name of the Faculty: Ms. Loveleen Sharma

Discipline: Aeronautical Engineering

Semester: 7th

Subject: Helicopter Dynamics

Work Load (Lecture/Practical) per week (in hours): Lectures- 4 , Practicals- 0

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	Historical development of helicopter and overview	1 <sup>st</sup>	
	2 <sup>nd</sup>	Basic concepts, Introduction to hovering		
	3 <sup>rd</sup>	forward flight theory		
	4 <sup>th</sup>	Rotor blade motion		
2 <sup>nd</sup>	5 <sup>th</sup>	flapping, feathering motion	2 <sup>nd</sup>	
	6 <sup>th</sup>	feathering motion		
	7 <sup>th</sup>	lagging motion		
	8 <sup>th</sup>	Composite structures.		
3 <sup>rd</sup>	9 <sup>th</sup>	Assignment 1	3 <sup>rd</sup>	
	10 <sup>th</sup>	The actuator-disc theory		
	11 <sup>th</sup>	Working states of rotor		
	12 <sup>th</sup>	Optimum rotor, Efficiency of rotor		
4 <sup>th</sup>	13 <sup>th</sup>	Ground effect on lifting rotor	4 <sup>th</sup>	
	14 <sup>th</sup>	The effect of finite number of blades		
	15 <sup>th</sup>	Induced velocity and induced power in forward flight		
	16 <sup>th</sup>	Mangler and Squire method		
5 <sup>th</sup>	17 <sup>th</sup>	Mangler and Squire method	5 <sup>th</sup>	
	18 <sup>th</sup>	flight and wind tunnel test		
	19 <sup>th</sup>	The vortex wake.		
	20 <sup>th</sup>	Aerofoil characteristics in forward flight		
6 <sup>th</sup>	21 <sup>st</sup>	Assignment 2	6 <sup>th</sup>	
	22 <sup>nd</sup>	Blade forces and motion in forward flight		
	23 <sup>rd</sup>	Blade forces and motion in forward flight		
	24 <sup>th</sup>	motion in forward flight		
7 <sup>th</sup>	25 <sup>th</sup>	Force, torque	7 <sup>th</sup>	
	26 <sup>th</sup>	flapping coefficient		
	27 <sup>th</sup>	flapping coefficient		
	28 <sup>th</sup>	flapping coefficient		

8 <sup>th</sup>	29 <sup>th</sup>	Helicopter trim analysis	8 <sup>th</sup>	
	30 <sup>th</sup>	Helicopter trim analysis		
	31 <sup>st</sup>	Performance in forward flight		
	32 <sup>nd</sup>	Performance in forward flight		
9 <sup>th</sup>	33 <sup>rd</sup>	Assignment 3	9 <sup>th</sup>	
	34 <sup>th</sup>	Longitudinal and lateral stability		
	35 <sup>th</sup>	Longitudinal and lateral stability		
	36 <sup>th</sup>	Longitudinal and lateral stability		
10 <sup>th</sup>	37 <sup>th</sup>	Equations of motion	10 <sup>th</sup>	
	38 <sup>th</sup>	Equations of motion		
	39 <sup>th</sup>	Stability characteristics		
	40 <sup>th</sup>	Auto stabilization		
11 <sup>th</sup>	41 <sup>st</sup>	Auto stabilization	11 <sup>th</sup>	
	42 <sup>nd</sup>	Control response		
	43 <sup>rd</sup>	Exciting forces		
	44 <sup>th</sup>	Exciting forces		
12 <sup>th</sup>	45 <sup>th</sup>	Fuselage response	12 <sup>th</sup>	
	46 <sup>th</sup>	Fuselage response		
	47 <sup>th</sup>	Vibration absorbers		
	48 <sup>th</sup>	Vibration absorbers		
13 <sup>th</sup>	49 <sup>th</sup>	Measurement of vibrations	13 <sup>th</sup>	
	50 <sup>th</sup>	Measurement of vibration in flight		
	51 <sup>st</sup>	Assignment 4		
	52 <sup>nd</sup>	Class Test		
14 <sup>th</sup>	53 <sup>rd</sup>	Revision Class	14 <sup>th</sup>	
	54 <sup>th</sup>	Revision Class		
	55 <sup>th</sup>	Revision Class		
	56 <sup>th</sup>	Revision Class		
15 <sup>th</sup>	57 <sup>th</sup>	Class Test	15 <sup>th</sup>	
	58 <sup>th</sup>	Revision Class		
	59 <sup>th</sup>	Revision Class		
	60 <sup>th</sup>	Revision Class		