

**GOPAL KRISHNA COLLEGE OF  
ENGINEERING AND TECHNOLOGY**  
**GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005**

**LESSON PLAN**

**Name of the Subject: INTERNAL COMBUSTION ENGINES AND GAS  
TURBINES(ICE & GT)**

**Name of the Faculty: Er.AMAR GOUTAM BISWAL**

**Subject Code: MEPC3004**

**Course Structure: 3-0-0**

**Semester: 6th Semester**

**Semester From: December to April**

**Branch: Mechanical**

**No. of Weeks: 15 Weeks**

<b>Week</b>	<b>Day</b>	<b>Theory Topics</b>	<b>Class</b>
<b>1st</b>	1st	Introduction to IC engines and classification	1
	2nd	Applications of IC engines	1
	3rd	Four-stroke SI and CI engines	1
<b>2nd</b>	1st	Two-stroke SI and CI engines	1
	2nd	Engine components and functions	1
	3rd	Fuel–air cycles	1
<b>3rd</b>	1st	Actual cycles vs air-standard cycles	1
	2nd	Valve timing diagrams	1
	3rd	Port timing diagrams	1
<b>4th</b>	1st	Engine performance parameters (IP, BP, FP)	1
	2nd	BSFC and efficiencies	1
	3rd	Numerical problems (Module-I)	1

<b>Week</b>	<b>Day</b>	<b>Theory Topics</b>	<b>Class</b>
<b>5th</b>	1st	Combustion in SI engines	1
	2nd	Flame speed and ignition lag	1
	3rd	Abnormal combustion: detonation and preignition	1
<b>6th</b>	1st	Factors affecting detonation	1
	2nd	Combustion in CI engines	1
	3rd	Delay period and diesel knock	1
<b>7th</b>	1st	Fuel spray and atomization	1
	2nd	Combustion chambers (SI & CI)	1
	3rd	Numerical/problem-solving (Module-II)	2
<b>8th</b>	1st	Carburetion systems	1
	2nd	Fuel injection systems	1
	3rd	Electronic fuel injection (EFI)	1
<b>9th</b>	1st	CRDI systems	1
	2nd	Supercharging and turbocharging	1
	3rd	Spark plugs and glow plugs	1
<b>10th</b>	1st	Governing of IC engines	1
	2nd	Emission formation (NO <sub>x</sub> , CO, HC, PM)	1
	3rd	Emission control techniques	1
<b>11th</b>	1st	Catalytic converters, EGR	1
	2nd	DPF and SCR systems	1

<b>Week</b>	<b>Day</b>	<b>Theory Topics</b>	<b>Class</b>
	3rd	Revision (Module-III)	1
<b>12th</b>	1st	Introduction to gas turbines	1
	2nd	Classification of gas turbines	1
	3rd	Open and closed cycle gas turbines	1
<b>13th</b>	1st	Brayton cycle (ideal and actual)	1
	2nd	Regeneration, intercooling, reheating	1
	3rd	Gas turbine fuels and materials	1
<b>14th</b>	1st	Blade cooling techniques	1
	2nd	Performance analysis	1
	3rd	Efficiency improvements	1
<b>15th</b>	1st	Compressors: axial and centrifugal	1
	2nd	Combustion chambers	1
	3rd	Turbines: impulse and reaction	1
<b>16th</b>	1st	Nozzle and diffuser principles	1
	2nd	Gas turbine applications	1
	3rd	Final revision and doubt clearing	1

#### Books Recommended

1. Internal Combustion Engines — **V. Ganesan**
2. Internal Combustion Engines — **John B. Heywood**
3. A Textbook of Internal Combustion Engines — **R. K. Rajput**
4. Gas Turbines — **V. Ganesan**
5. Gas Turbine Theory — **H. I. H. Saravanamuttu, G. F. C. Rogers and H. Cohen**

## Teaching Methodology

- Chalk and board teaching
- PPT presentations with engine diagrams and animations
- Numerical problem-solving sessions
- Tutorial and assignment discussions
- Case studies on automotive and gas turbine systems
- Revision and interactive doubt-clearing sessions

## Assessment Strategy

- Internal assessment examinations
- Tutorial and assignment evaluation
- Numerical problem-solving tests
- Attendance and classroom interaction
- Semester end examination as per Biju Patnaik University of Technology guidelines