



SARVAJANIK UNIVERSITY
Sarvajnik College of Engineering and Technology
Bachelor of Technology



Mechanical Engineering Department
Semester VII

Course Name: Turbines, Compressors, Fans and Blowers **Course Code:** BTME15704

Type of course: Open Electives Course (OEC)

Prerequisite: Fluid Mechanics and Basic Mechanical Engineering

Course Outline: The course's goal is to give students a firm foundation for comprehending different kinds of turbomachines. The course covers fluid flow patterns, basic operational concepts, and the significance of rotating components in various turbo machines.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	00	00	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests) **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Course Contents:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	Introduction: Turbo-machines, Turbines, Pumps, Compressors, Fans and Blowers, Compressible and Incompressible Flow machines. Classification: Axial flow, radial flow and mixed flow machines.	6	15%
2.	Gas, Steam and Hydro Turbines: Introduction to Gas turbine power plants, Steam Turbine power plants and Hydro turbine power plants. Open and close circuit Gas turbine power plants and Aircraft Gas turbines plants. Types of Steam turbines. Industrial steam turbines. Type of Hydro turbines. Basic laws and governing equations of Gas, Steam and Hydro Turbines.	12	30%



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



Sr. No.	Topics	Teaching Hrs.	Module Weightage
3.	Axial and Centrifugal Compressors: Elements of axial and centrifugal compressor, Classifications, Construction and working with its applications	6	15%
4.	Axial Fans and Propellers: Fan and Propellers Application. Construction and elements of an axial flow fan and propeller.	6	15%
5.	Centrifugal Fans and Blowers: Elements of centrifugal Fan and blower, Types of centrifugal fan and blower, Dust erosion of fans, Simple design of centrifugal fan.	8	20%
6.	Wind Turbines: Elements of Wind power plant, Available energy and site selection, Types of wind turbines, Application, Advantages and disadvantages.	7	15%

Percentage Distribution of Marks as per Bloom’s Taxonomy (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	25	20	10	5

Legends: R: Remembrance, U: Understanding; A: Application, N: Analyze, E: Evaluate C: Create

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



Reference Books:

Sr. no.	Title of book /article	Author(s)	Publisher	Publication year	Publication edition
1.	Turbines, Compressors and Fans	S. M. Yahya	Tata McGraw-Hill	2017	4th
2.	Axial-Flow Compressors: A Strategy for Aerodynamic Design and Analysis	Ronald H Aungier	Khanna publishers	2003	2nd
3.	Centrifugal Compressors: A Strategy for Aerodynamic Design and Analysis	Ronald H Aungier	S. Chand & Co Ltd.	2000	1st
4.	Handbook of Fluid Movers: Pumps, Compressors, Fans And Blowers	Dr. Jonathan Moore	Tata McGraw Hill	2015	1st
5.	Fans	Dr. Ing Bruno Eck	Pergamon Press, Oxford	1972	1st

Course Outcomes (CO's):

CO No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Examine the application Turbo machines	25
CO-2	Explain the working principles of Turbines, Compressor, Fans and Blowers.	25
CO-3	Analyze the flow within Turbines, Compressor, Fans and Blowers.	25
CO-4	Recognize and advertise the importance of turbomachines for sustainable development.	25



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and Technology
Bachelor of Technology



Mapping of CO's with Program Outcomes (PO's):

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO-1	3	2	1	1	0	0	1	0	1	1	1	1
CO-2	2	2	2	2	1	1	1	1	1	1	2	2
CO-3	3	3	3	2	1	1	1	1	1	1	3	3
CO-4	3	3	2	1	0	0	2	0	0	1	2	2
Rational e	11	10	8	6	2	2	5	2	3	4	8	8

Rationale - Mapping of CO's with PO's:

As per CO's and PO's mapping, this course will provide students a thorough grasp of the engineering behind various turbomachines. In order to build and create sustainable solutions for future turbomachines, this course will assist students in realizing the value of diverse turbomachines in engineering applications.

Assignments to be given as per the requirement of the course.

List of Open learning websites:

1. <https://nptel.ac.in/courses/101101058>
2. <https://nptel.ac.in/courses/112104305>
3. <https://nptel.ac.in/courses/112104117>