



**Course Title:** Integrated Respiratory and Cardiovascular Biology

**Course Code:** BIOT332

**Credit Units:** 03

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
3	-	-	-	03

### Course Objectives:

The course is designed to give students a perspective on the integrated physiological systems such as respiratory and cardiovascular physiology and their relevance to physiological homeostasis.

**Pre-requisites:** Life Sciences, Biochemistry, Human physiology

**Student Learning Outcomes:** By the end of the course, students would be able to:

- Comprehend the intricate nuances of respiratory physiology and cardiovascular physiology
- Apply the knowledge of respiratory and cardiovascular physiology in regulation of homeostasis

### Course Contents

#### Theory:

	Weightage (%)
<b>Module I: Introduction to Lung Physiology</b>	<b>20</b>
Introduction to lung physiology, airway physiology, Weibel model of the airways and its implications in lung physiology, measurement of lung volumes conventional spirometry and its salient differences with plethysmography.	
<b>Module II: Carriage of Gases and Acid-base Balance</b>	<b>20</b>
Transport of gases in blood, role hemoglobin in transport of gases, Oxygen and carbon dioxide dissociation curves, Carriage of carbon dioxide in blood, role of acid-base balance in lung physiology.	

<b>Module III: Chemical and Neural Control of Ventilation</b>	<b>20</b>
Oxygen delivery to tissues and tissue hypoxia, Role of Diffusion in lung physiology, Pulmonary Blood flow, Chemical and Neural Control of Ventilation.	
<b>Module IV: Introduction to Cardiac Physiology</b>	<b>20</b>
Introduction to Cardiac Physiology, differences between pulmonary and systemic circulation, features of systemic circulation, role of systole and diastole in cardiac function. Introduction to cardiac diseases, arterio-venous oxygen difference and cardiac output, Anomalies related to systemic circulation (myocardial ischemia, atherosclerosis, ventricular hypertrophy).	
<b>Module V: Electrical Circuitry of Heart</b>	<b>20</b>
Action potential, ECG as an index of heart function, anomalies in the electrical circuitry of heart	

**Pedagogy for Course Delivery:**

Lectures: 43 hrs

Class Test: 2

Total: 45 hrs

**Lab/ Practical details, if applicable: NA**

**Assessment/ Examination Scheme:**

<b>Theory L/T (%)</b>	<b>Lab/Practical/Studio (%)</b>	<b>End Term Examination</b>
<b>100</b>	<b>-</b>	<b>100</b>

**Theory Assessment (L&T):**

<b>Components</b>	<b>Class Test 1</b>	<b>Class Test 2</b>	<b>Quiz</b>	<b>Attendance</b>	<b>End Term Examination</b>
<b>Weightage (%)</b>	<b>10</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>70</b>

**Text Books:**

Essentials of Respiratory Physiology by John. B West, 9<sup>th</sup> Edition, (2012), ISBN 978-1609136406

Text Book of Medical Physiology by Arthur C. Guyton and John E. Hall (2009), ISBN 978-1-4160-4574-8