



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

M.S. Ramaiah University of Applied Sciences

Program Structure and Course Details

Of


Master of Physiotherapy

Batch 2022 onwards


Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

M.S. Ramaiah University of Applied Sciences

M.S. Ramaiah College of Physiotherapy


Principal and Dean
M.S. Ramaiah College of Physiotherapy
M.S. Ramaiah University of Applied Sciences


Dean - Academics
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054



Programme Specifications

Master of Physiotherapy Programme

Programme:
Cardiovascular and
Pulmonary Sciences

Department:
Cardiovascular and Pulmonary
Physiotherapy

M.S. Ramaiah College of Physiotherapy
M.S. Ramaiah University of Applied Sciences



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Approved by the Academic Council at its 26th Meeting held on 14th July 2022

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University's Vision, Mission and Objectives

The M. S. Ramaiah University of Applied Sciences (MSRUAS) will focus on student-centric professional, education and motivates its staff and students to contribute significantly to the growth of technology, science, economy and society through their imaginative, creative and innovative pursuits. Hence, the University has articulated the following vision and objectives.

Vision

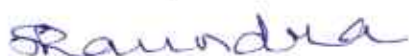
MSRUAS aspires to be the premier university of choice in Asia for student centric professional education and services with a strong focus on applied research whilst maintaining the highest academic and ethical standards in a creative and innovative environment

Mission

Our purpose is the creation and dissemination of knowledge. We are committed to creativity, innovation and excellence in our teaching and research. We value integrity, quality and teamwork in all our endeavours. We inspire critical thinking, personal development and a passion for lifelong learning. We serve the technical, scientific and economic needs of our Society.

Objectives

1. To disseminate knowledge and skills through instructions, teaching, training, seminars, workshops and symposia in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to equip students and scholars to meet the needs of industries, business and society
2. To generate knowledge through research in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences to meet the challenges that arise in industry, business and society
3. To promote health, human well-being and provide holistic healthcare
4. To provide technical and scientific solutions to real life problems posed by industry, business and society in Engineering and Technology, Art and Design, Management and Commerce, Health and Allied Sciences, Physical and Life Sciences, Arts, Humanities and Social Sciences
5. To instil the spirit of entrepreneurship in our youth to help create more career opportunities in the society by incubating and nurturing technology product ideas and supporting technology backed business
6. To identify and nurture leadership skills in students and help in the development of our future leaders to enrich the society we live in
7. To develop partnership with universities, industries, businesses, research establishments, NGOs, international organizations, governmental organizations in India and abroad to enrich the experiences of faculties and students through research and developmental programmes



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Section 1

Programme Specifications: Master of Physiotherapy (Cardiovascular and Pulmonary Sciences)

College	M.S. Ramaiah College of Physiotherapy
Department	Cardiovascular and Pulmonary Physiotherapy
Programme	Cardiovascular and Pulmonary Sciences
Dean of College	Prof. Savita Ravindra

1.1 Title of The Award

Master of Physiotherapy (Cardiovascular and Pulmonary Sciences)

1.2 Mode of Study

Full Time

1.3 Awarding Institution /Body

M.S. Ramaiah University of Applied Sciences

1.4 Joint Award

Not Applicable

1.5 Teaching Institution

M. S. Ramaiah College of Physiotherapy, M.S. Ramaiah University of Applied Sciences

1.6 Programme Approved date by the Academic Council of the University

14th July 2022

1.7 Next Review Date:

July 2024/ 2025

1.8 Programme Approving Regulating Body and Date of Approval

1.9 Programme Accredited Body and Date of Accreditation

1.10 Grade Awarded by the Accreditation Body

1.11 Programme Accreditation Validity Duration

1.12 Programme Benchmark



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1.13 Rationale for the Programme

Cardiovascular and pulmonary diseases are the leading cause of global mortality and the major cause of disability. According to WHO, Ischemic heart disease and respiratory infections are considered to be in top 5 of the global burden of the disease. The World Health Organization estimates that lung infections, lung cancer and COPD accounted for one-tenth of the disability-adjusted life-years (DALYs) lost worldwide in 2008. Several Non-communicable diseases (NCDs) such as cardiovascular disease (CVD), Cancers, Diabetes and COPD are linked by common life style determinants such as diet, physical activity and tobacco consumption.

In recent years, Cardiovascular and pulmonary physiotherapists have established an important role within the integrated care continuum of patients with cardiovascular and respiratory diseases, ranging from chronic outpatient care (e.g., exercise training) to critically ill care in the intensive care unit (ICU) (e.g., early mobilisation). The cardiovascular and pulmonary physiotherapists work in a multi-disciplinary team with an integrated approach in all settings towards achieving the optimal health and well-being of the patient.

1.14. Programme Aims and Objectives

Cardiovascular and Pulmonary Sciences deals with prevention and treatment of the Cardiovascular and Pulmonary disorders. This intensive MPT programme has a strong clinical basis with sound knowledge base and aims to develop the cognitive, psychomotor, research and interpersonal skills required to enable a postgraduate to undertake the independent practice at a specialist level. They gain the ability to analyse problems, discuss evidence-based options, select appropriate treatment, and develop the clinical skills to execute the treatment with a high degree of competence with empathetic attitude.

The aims and objectives are to:

1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in prevention, management and rehabilitation of subjects with cardiovascular and pulmonary conditions.
2. Identify and analyse specific risks and dysfunction related to cardiovascular and pulmonary conditions based on sound clinical reasoning.
3. Work with integrity and autonomy in an interdisciplinary team.
4. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries.
5. Involve in undergraduate and postgraduate teaching with competence.
6. Conduct research activities and utilize findings for professional development and lifelong learning.

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1.15. Programme Outcomes

At the end of the Masters Programme the student will be able to:

- PT 162 PO1: Demonstrate the ability to independently plan and conduct a structured comprehensive patient-centred physiotherapy assessment and formulate a functional diagnosis
- PT 162 PO2: Demonstrate the ability to use clinical reasoning and critical thinking to establish patient-centred goals and prescribe an individualized plan based on established standards of practice
- PT 162 PO3: Demonstrate evidence-based interventional skills in managing health conditions across lifespan in different settings using reflective practice
- PT 162 PO4: Conduct research work under supervision and communicate the findings
- PT 162 PO5: Display entrepreneurial, pedagogical and leadership skills in a team across various healthcare and academic settings.

1.16. Programme Structure

The postgraduate program is designed as a program, wherein at the end of two years, a programme-end examination will be conducted by the University. The programme will consist of four courses and the student will have to pass all the courses collectively. In addition, the programme will have an ongoing assessment of performance and the student will be required to complete a set of defined prerequisites in order to be eligible for appearing in the programme ending examination.

The following are the courses a student is required to complete to appear in the programme ending examination

S. No.	Course Title	Course Code
1	Fundamentals in Physiotherapy Practice, Pedagogy and Research	PT F 5 01 A
2	Foundations Of Cardiovascular and Pulmonary Sciences	PT C 5 01 A
3	Assessment Approaches & Diagnosis in Cardiovascular & Pulmonary Physiotherapy	PT C 5 02 A
4	Physiotherapy Interventions in Cardiovascular and Pulmonary Disorders	PT C 5 03 A

Students' enrolled in the MPT programme shall also undertake the following electives:

Programme Electives – These electives are mandatory for the MPT Programme.

- Professional Ethics
- Basic Life Support
- Basic course in Biomedical Research

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Open Electives – These electives a candidate has to take up a minimum of 1 elective.

- Advanced Life Support
- Medico legal aspects in patient care
- Quality management in Healthcare
- Financial Literacy

*Outline of all the electives is provided in the **Annexure 1**

1.17. Course Delivery Structure

The courses will be delivered from Monday to Saturday of the week. The calendar of events of the programme and the courses shall be available at the beginning of the programme. A detailed time-table shall be available to the students at the beginning of each month.

1.18. Teaching Learning Methods

The Teaching and Learning Methods will include but not limited to:

1. Lectures
2. Seminars
3. Group discussions
4. Self-directed Learning
5. Journal review meetings
6. Demonstrations and Skill Labs
7. Case Discussion and Presentation
8. Patient Care in various settings
9. Field visits
10. Inter disciplinary meetings and discussions
11. Continuing Professional Development Programs
12. Conferences / Workshop / Symposium programmes
13. Research and Dissertation

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SECTION 2: COURSE SPECIFICATIONS**Course 1: Fundamentals in Physiotherapy Practice, Pedagogy and Research**

Course Title	Fundamentals in Physiotherapy Practice, Pedagogy and Research
Course Code	PT F 5 01 A
Course Type	Core Theory Course
Department	Cardiovascular and Pulmonary Sciences
College	Physiotherapy

1. Course Summary

This fundamental course in physiotherapy is designed to train postgraduate students in principles of professional practice, research methods, biostatistics and ethics. It also provides training in application of exercise physiology and electrophysiology in clinical decision making. Beyond subject knowledge, the course also aims to train the postgraduates in teaching skills, management skills and entrepreneurship

2. Course Size and Credits:

Number of Credits	NA
Credit Structure (Lecture: Tutorial: Practical)	NA
Total Hours	As per Academic Regulations
Number of Weeks	As per Academic Regulations
Department Responsible	Cardiovascular and Pulmonary Sciences
Total Course Marks	100
Pass Criterion	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

3. Course Outcomes (COs)

On completion of the course, the postgraduate student will be able to

PT F 5 01 A CO1 :Discuss the principles of professional standards and ethics in evidence-based physiotherapy practice.

PT F 5 01 A CO2: Analyse and apply appropriate research methods and relevant biostatistics in research

PT F 5 01 A CO3: Apply the principles of exercise physiology and electrophysiology in clinical decision making

PT F 5 01 A CO4: Discuss different learning theories and taxonomies.

PT F 5 01 A CO5: Demonstrate teaching learning methods in microteaching environment.

PT F 5 01 A CO6 Explain the management processes and responsibilities as applied to principles of physiotherapy practice

PT F 5 01 A CO7: Discuss the nature of entrepreneurship in rehabilitation



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4. Course Contents

1. Principles and Core Professional Values of Physiotherapy Practice

- a. Definition of Physiotherapy, Scope of Practice
- b. General and Professional competencies
- c. Physiotherapy Knowledge, Skill and Education Framework
- d. Introduction to World Physiotherapy Standards of Physical Therapy Practice Guideline
- e. International Classification of Functioning Disability and Health.
- f. Principles of Evidence Based Practice in Physiotherapy

2. Research Methodology and Biostatistics

Designing Clinical Research: Basic Ingredients

- a. Getting Started: The Anatomy and Physiology of Clinical Research
- b. Fundamentals of Literature Search and Review
- c. Conceiving the Research Question and Developing the Study Plan
- d. Choosing the Study Subjects: Specification, Sampling, and Recruitment
- e. Planning the Measurements: Precision, Accuracy, and Validity
- f. Hypotheses and Underlying Principles to Estimating Sample Size and Power

Designing Clinical Research: Study Designs

- g. Designing Cross-Sectional, Case-Control and Cohort Studies
- h. Enhancing Causal Inference in Observational Studies
- i. Designing a Randomized Blinded Trial, Alternative Clinical Trial Designs and their Implementation Issues
- j. Designing Studies of Diagnostic Tests
- k. Research Using Existing Data
- l. Fundamentals of Qualitative Research Methods
- m. Fundamentals of Systematic Reviews and Meta-analysis

Ethical Principles in Conducting Research

- n. ICMR Ethical Guidelines for Biomedical Research

Implementation of Clinical Research

- o. Designing Questionnaires, Interviews, and Online Surveys
- p. Implementing the Study and Quality Control
- q. Data Management


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Biostatistics

- r. Basic Fundamentals of Biostatistics
- s. Probability and Normal Distribution
- t. Descriptive Statistics: Measures of Central Tendency and Spread
- u. Hypothesis Testing: One-Sample Inference, Two-Sample Inference, Multi-sample Inference,
- v. Hypothesis Testing: Nonparametric Methods, Categorical Data
- w. Regression, Correlation Methods and Diagnostic Tests

Consuming and Disseminating Research

- x. Strategies for following Emerging Evidence, Clinical Practice Guidelines and Clinical pathways
- y. Best Practices in Research Dissemination
- z. Writing a Manuscript for Publication

3. Exercise Physiology

- a. Fundamentals of Human Energy Transfer
- b. Source of Nutrition and Energy, Macro and Micro Nutrients, Food Energy and Optimum Nutrition for Exercise
- c. Energy Expenditure During Rest and Physical Activity
- d. Body Composition, Its Evaluation, Obesity and Weight Control
- e. Training the Anaerobic and Aerobic Energy Systems

4. Electrophysiology

- a. Instrumentation for neuromuscular electrical stimulation.
- b. Muscles plasticity in response to electrical stimulation.
- c. Electrical stimulation and its effects on various systems.

5. Pedagogy in Physiotherapy Education

- a. Basics of Adult Learning Theories including Learning Styles
- b. Formulating Intended Learning Outcomes.
- c. Teaching Learning Methods
- d. Assessment Methods

6. Management, Entrepreneurship and Leadership in Physiotherapy Practice

- a. Introduction to Management in Physiotherapy: Definition, Principles and Functions
- b. Management Process: Planning, Organizing, Directing, Controlling. Decision making.
- c. Responsibilities of the Physiotherapy Manager
- d. Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers
- e. Leadership: Need, Relevance, Competencies and Characteristics


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5. Course Map (CO-PO Map)

Course Outcome	Program Outcomes				
	PT 162 PO1	PT 162 PO2	PT 162 PO3	PT 162 PO4	PT 162 PO5
PT F 5 01 A CO1		2			
PT F 5 01 A CO2				2	
PT F 5 01 A CO3	3		2		
PT F 5 01 A CO4				2	2
PT F 5 01 A CO5				2	2
PT F 5 01 A CO6			1		
PT F 5 01 A CO7					1
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution					

6. Course Teaching and Learning Methods

The Teaching and Learning Methods will include but not limited to:

Sl. No. ¹	Teaching and Learning Methods	
1	Lectures	✓
2	Seminars	✓
3	Group discussions	✓
4	Self-directed Learning	✓
5	Journal review meetings	✓
6	Demonstrations and Skill Labs	✓
7	Case Discussion and Presentation	✓
8	Patient Care in various settings	✓
9	Field visits	
10	Inter disciplinary meetings and discussions	
11	Continuing Professional Development Programs	
12	Conferences / Workshop / Symposium programmes	
13	Research and Dissertation	

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7. Course Assessment and Reassessment

The details of the components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Masters of Physiotherapy (MPT) Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document.

8. Course Resources

1. World Physiotherapy (2019) Description of Physical Therapy: Policy Statement. Available from <https://world.physio/sites/default/files/2020-07/PS-2019-Description-of-physical-therapy.pdf>
2. World Physiotherapy (2011) Physical Therapist Professional Entry Level Education Guideline. (Available from: <https://world.physio/sites/default/files/2020-07/G-2011-Entry-level-education.pdf>)
3. CSP (2011) Physiotherapy Framework: Putting physiotherapy Behaviours, Values, Knowledge & Skills into Practice [updated May 2020](Available from: <https://www.csp.org.uk/professional-clinical/cpd-education/professional-development/professional-frameworks>)
4. Expected Minimum Competencies for an Entry Level Physiotherapist in the Europe Region World Physiotherapy Guidance Document (Available from: https://www.erwcept.eu/education/expected_minimum_competencies_for_entry_level)
5. Evidence-Based Medicine: How to Practice and Teach EBM, 2nd Edition: By David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, and R. Brian Haynes, Churchill Livingstone, 2000
6. Rob Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead. Practical Evidence-Based Physiotherapy (Second Edition), Churchill Livingstone,
7. 2011, ISBN 9780702042706,
8. World Physiotherapy (2011) Standards of Physical Therapy Practice Guideline(Available from: <https://world.physio/sites/default/files/2020-06/G-2011-Standards-practice.pdf>)
9. 2017 ICMR National Ethical Guidelines for Biomedical and Health Research involving Human Participant
10. 2020 ICMR Policy on Research Integrity and Publication Ethics (RIPE)
11. Designing Clinical Research 4th Edition. Stephen B. Hulley et al. Published By: Lippincott Williams & Wilkins. ISBN-13: 9781469840543
12. Medical Biostatistics (Chapman & Hall/CRC Biostatistics Series). 4th Edition 2017. Abhaya Indrayan, Rajeev Kumar Malhotra. Chapman and Hall/CRC. ISBN 9781498799539
13. Exercise Physiology Nutrition, Energy, and Human Performance. 8th Edition. William D. McArdle PhD, Frank I. Katch, Victor L. Katch. Lippincott Williams & Wilkins. ISBN/ISSN: 9781451191554
14. Principles of Medical Education. 4th Edition. Tejinder Singh, Piyush Gupta, Daljit Singh. 2013. Jaypee Publishers.
15. Management in Physical Therapy Practices, 2nd Edition. Catherine G. Page PT, MPH, PhD. ISBN-13: 978-0-8036-4033-7
16. Heather A. Current thinking on Leadership and Physiotherapy Practice, 2016. Report Prepared for AGILE Professional Network of the Chartered Society of Physiotherapy

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(Available from: https://agile.csp.org.uk/system/files/current_leadership_thinking_and_physiotherapy_practice.pdf)

9. Course Organization

Course Code	PT F 5 01 A		
Course Title	Fundamentals in Physiotherapy Practice, Pedagogy and Research		
Course Leader's Name	Dr. Sundar Kumar V		
Course Leader's Contact Details	Phone:	9739468755	
	E-mail:	Sundar.rcp@msruas.ac.in	
Course Specifications Approval Date	26.9.2022		
Next Course Specifications Review Date	01.07.2024		
Subsequent Course Specifications Review Date			

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Course 2: Foundations of Cardiovascular and Pulmonary Sciences

Course Title	Foundations of Cardiovascular and Pulmonary Sciences
Course Code	PT C 5 01 A
Course Type	Core Theory Course
Department	Cardiovascular and Pulmonary Sciences
College	Physiotherapy

1. Course Summary

This course is designed to give information about anatomical, physiological and pathophysiological & pathomechanical framework. It imparts fundamental knowledge on structure and function of cardiovascular and respiratory system of the human body. This course facilitates the students to gain better understanding on cardiovascular and respiratory disease and to prepare them for further study in the course discipline.

2. Course Size and Credits:

Number of Credits	NA
Credit Structure (Lecture: Tutorial: Practical)	NA
Total Hours	As per Academic Regulations
Number of Weeks Annually	As per Academic Regulations
Department Responsible	Cardiovascular and Pulmonary Sciences
Total Course Marks	100
Pass Criterion	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

3. Course Outcomes (COs)

On completion of the course, the postgraduate student will be able to

- PT C 5 01 A CO1: Apply and analyse biomedical and patho-mechanical knowledge in physiotherapy clinical decision making in cardiovascular and pulmonary disorders.
- PT C 5 01 A CO2: Discuss the impact of pharmacological interventions on exercises in cardiovascular and pulmonary system.
- PT C 5 01 A CO 3: Explain the physiological changes during exercise across life span in various settings.
- PT C 5 01 A CO 4: Discuss the principles of health promotion and fitness of various life style disease.



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4. Course Contents

1. **Applied Anatomy, Physiology, and Biomechanics of Respiratory System**
 - a. Applied Anatomy, developmental anatomy and physiology of the respiratory system in health and its application in various respiratory dysfunctions.
 - b. Biomechanics and patho mechanics of respiration throughout lifespan
 - c. Effect of Body positioning on pulmonary functions.
 - d. Pathology, Pathophysiology of various acute and chronic diseases affecting the respiratory systems.
2. **Applied Anatomy and Physiology of Cardiovascular System**
 - a. Applied Anatomy, developmental anatomy and physiology of the cardiovascular dysfunction across lifespan
 - b. Effect of Body positioning on Cardiovascular system
 - c. Cardiovascular Control Mechanism
 - d. Pathology, Pathophysiology of various acute and chronic diseases affecting the cardio vascular systems.
3. **Cardiovascular & Pulmonary Pharmacotherapy**
 - a. Impact of Pharmacotherapeutics in Cardiovascular and Pulmonary conditions and its relevance in exercise prescription and rehabilitation.
4. **Exercise Physiology**
 - a. Impact of body composition on resting metabolic rate and sub maximal exercise oxygen consumption
 - b. Energy consumption and MET value of various physical activity and exercise.
 - c. Physiological variations, responses and adaptations (age/gender) of cardiovascular and respiratory system to different types of exercise and training.
 - d. Environmental influence on exercise performance including impact of pollution on exercise training
 - e. Factors affecting physiological function, the environment and special aids to performance.
5. **Health Promotion & Fitness**
 - a. Principles and concepts of training in fitness and wellness.
 - b. Exercise intolerance in health across life span and various life style disease
 - c. Biochemical primers and the influence of genetics and metabolomics on cardiorespiratory fitness.


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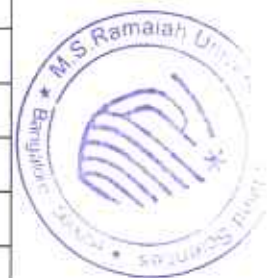
5. Course Map (CO-PO Map)

Program Outcome / Course Outcome	PT 162 PO1	PT 162 PO2	PT 162 PO3	PT 162 PO4	PT 162 PO5
PT C 5 01 A CO1	3	2			
PT C 5 01 A CO2			2		
PT C 5 01 A CO3			2		
PT C 5 01 A CO4		3			
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution					

6. Course Teaching and Learning Methods

The Teaching and Learning Methods will include but not limited to:

Sl. No.	Teaching and Learning Methods	
1	Lectures	✓
2	Seminars	✓
3	Group discussions	✓
4	Self-directed Learning	✓
5	Journal review meetings	✓
6	Demonstrations and Skill Labs	✓
7	Case Discussion and Presentation	✓
8	Patient Care in various settings	✓
9	Field visits	
10	Inter disciplinary meetings and discussions	
11	Continuing Professional Development Programs	
12	Conferences / Workshop / Symposium programmes	
13	Research and Dissertation	



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7. Course Assessment and Reassessment

The details of the components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Masters of Physiotherapy (MPT) Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document.

8. Course Resources

Recommended Books

1. Walter T.ACSMs Clinical Exercise Physiology by Walter R Thompson, 10th ed .Lippincott Williams & Wilkins;2013
2. Kenney, W. Larry, Wilmore, Jack, Costill, David. Physiology of sports and exercise by Jack H.Willmore, Costill & Kenney,6th ed. .Human Kinetics; 2015
3. William D. McArdle, Frank I. Katch, Victor L. Katch .Exercise Physiology by Mac Ardle , Katch & Katch, 8th ed. Lippincott Williams & Wilkins;2015
4. ML Pollock. Pollock Heart Disease and rehabilitation by Pollock ML .Wiley–Blackwell.1979
5. James Watkins. Fundamental biomechanics of sport and exercise by James Watkins .Taylor & Francis.2014
6. Richards J.The Comprehensive Text Book of Clinical biomechanics by Jim Richards. 2nded. Elsevier;2018
7. A Pressler, Niebauer J.Text book of sports and exercise cardiology by Axel Pressler and Josef Niebauer. 1st ed. Springer International Publishing.2020
8. Durstine L, Moore GE, MJ La Monte ,BA Franklin. Pollocks Textbook of Cardiovascular Disease and Rehabilitation by Larry Durstine, GE Moore .Human Kinetics; 2008.
9. Frost R. Applied Kinesiology by Robert Frost Applied Revised Edition: A Training Manual and Reference Book of Basic Principles and Practices. North Atlantic Books;2013
10. Pierce NB. Guide to mechanical ventilation and Intensive respiratory care.Saunders;1995
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15. Cifu DX. Braddoms Physical Medicine and Rehabilitation.5th ed. Elsevier Health Sciences;2015
16. William D. McArdle, Frank I. Katch, Victor L. Katch. Essentials of Exercise Physiology .Lippincott Williams & Wilkins; 2006
17. Sundar TS .Blood Gases by T Shyam Sundar.4th ed.Paras Medical Publisher;2020
18. Hall J. Guyton and Hall, Textbook of Medical Physiology.13th ed. Saunders; 2015
19. Pryor JA, Prasad A. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics 4th ed.Elsevier;2008
20. Smith M, Ball V. Cardiovascular / Respiratory physiotherapy by Mandy Smith. Elsevier;1998

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21. Frownfelter DL, Dean E. Principles and practice of cardiopulmonary physical therapy Donna I. Frownfelter, Elizabeth dean. Mosby Elsevier;1996
22. Downie AP, Cash JE. Cash's Textbook of Chest, Heart, and Vascular disorders for physiotherapists. 4th ed. Mosby Elsevier;1987
23. Froelicher V, Myers J. Exercise and the Heart (Cardiovascular Clinics), 5th ed. Elsevier;2006
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Recommended Journals

1. American Journal of Respiratory and Critical Care Medicine (Am J Respir Crit Care Med)
2. Chest (Chest)
3. Critical Care (Crit Care)
4. Diabetes Therapy
5. Experimental Diabetes Research
6. Indian Journal of Chest Diseases and Allied Sciences (Indian J Chest Dis Allied Sci)
7. Journal of Cardiopulmonary Rehabilitation and Prevention
8. Journal of Chronic Obstructive Pulmonary Disease
9. Journal of Exercise Physiology Online (J Exerc Physiol Online)
10. Lung India (Lung India)
11. Primary Care Diabetes
12. Primary care Respiratory Journal
13. Respiratory Research (Res.)
14. The Open Respiratory Medicine Journal
15. International Journal of Diabetes in Developing Countries
16. Clinics in Chest Medicine
17. Diabetes Research and Clinical Practice
18. British Journal of Diabetes and Vascular Disease
19. International Journal of Chronic Obstructive Pulmonary Disease (Int J Chron Obstruct Pulmon Dis)
20. Cardiopulmonary Physical Therapy Journal
21. Journal of Cardiac and Pulmonary Rehabilitation
22. Circulation
23. American Heart Journal
24. Journal of American Heart Association (JAHA)
25. International Journal of Cancer (IJC)
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27. British Journal of Cancer
28. CANCER
29. Cancer Journal
30. Supportive Care in Cancer
31. Asia Pacific Journal of Cancer Prevention

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Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials:

1. Lobelo F et al. Routine Assessment and Promotion of Physical Activity in Healthcare Settings: A Scientific Statement From the American Heart Association. *Circulation*. 2018;137(18): e495- e522
2. Starth SJ et al. Guide to the assessment of physical activity: Clinical and research applications: a scientific statement from the American Heart Association. *Circulation*. 2013;128(20):2259-79
3. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. *Circ Res*. 2015;117(2):207-19.
4. Spruit M et al. An official American Thoracic Society /European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. *Am J Respir Crit Care Med*. 2013;188(8): e13-6

9. Course Organization

Course Code	PT C 5 01 A	
Course Title	Foundations of Cardiovascular and Pulmonary Sciences	
Course Leader's Name	Shaswat Verma	
Course Leader's Contact Details	Phone:	9886591748
	E-mail:	Shaswatverma.rcp@msruas.ac.in
Course Specifications Approval Date	26.09.2022	
Next Course Specifications Review Date	01.07.2024	
Subsequent Course Specifications Review Date		

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**Course 3: Assessment Approaches and Diagnosis in Cardiovascular and Pulmonary
Physiotherapy**

Course Title	Assessment Approaches and Diagnosis in Cardiovascular and Pulmonary Physiotherapy
Course Code	PT C 5 02 A
Course Type	Core Theory Course
Department	Cardiovascular and Pulmonary Sciences
College	Physiotherapy

1. Course Summary

This course is designed to educate the students to acquire adequate information and skills required to carry out a cardiovascular and respiratory assessment and information including investigations along with bringing out functional diagnosis in order to plan out and execute the physiotherapy management.

2. Course Size and Credits:

Number of Credits	NA
Credit Structure	NA
Total Hours	As per academic Regulations
Number of Weeks in a Semester	As per Academic Regulations
Department Responsible	Cardiovascular and Pulmonary Sciences
Total Course Marks	100 + 100 (Theory + Practical) Registrar M.S. Ramaiah University of Applied Sciences Bangalore - 560 054
Pass Criterion	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

3. Course Outcomes (COs)

On completion of the course, the postgraduate student will be able to

PT C 5 02 A CO1: Demonstrate clinical decision-making skills in assessing and identifying impairments, activity limitations and participatory restrictions in acute care and rehabilitation settings.

PT C 5 02 A CO 2: Evaluate and plan an assessment and rehabilitation program for chronic cardiovascular and pulmonary diseases.

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4. Course Contents

1. Assessment, Monitoring and Outcome measures in Critical Care Rehabilitation

- a) ICU Equipment & Monitoring
- b) Evaluation in the critically ill patient
- c) Documentation
- d) Weaning Criteria
- e) Critical care complications
- f) Outcome measures used in critical care

2. Investigations and its implications in physiotherapy practice

- a) Investigations like ECG, Arterial blood gas, Electrolytes, Biochemical markers
- b) Chest radiographs, ultrasonography and echocardiography, PFT
- c) Clinical evaluations – Auscultation, Holter Monitoring, Doppler,
- d) Haematological and biochemical values and interpretations
- e) Early intervention priorities based on physical examination and investigations

3. Assessment of Cardiovascular and Pulmonary Disorder in Various settings

- a. Physical examination of Cardiovascular and Pulmonary system
- b. Evaluation of Pulmonary muscle strength & endurance in chronic Pulmonary disorders.
- c. Outcome measures used in Cardiovascular & Pulmonary disorders
- d. Cardiopulmonary and metabolic system – Cardiopulmonary exercise testing (CPET) /Stress testing in various cardiovascular disorders.
- e. ANS Dysfunction and Testing
- f. Assessment and special tests of Arterial, Venous and Lymphatic systems

4. Assessment of Cardiovascular and Pulmonary Disorder in OPD / Rehab Setting

- a. Health related fitness assessment (endurance, strength, flexibility and body composition) through various methods in various cardiovascular and pulmonary disease
- b. Risk Stratification
- c. Exercise Tolerance Test- (Advanced and traditional methods)
- d. Evaluating physical activity (subjective and objective) through appropriate outcome measures

5. Oncology

- a. Physical examination and screening of different types of cancer
- b. Special emphasize on cancer affecting head and neck, thorax and abdomen
- c. Cancer evaluation methods, outcome measures, functional evaluation
- d. Evaluation and Diagnostic tool/ Equipment's used to assess fatigue

6. Exercise Testing in different population

- a. Definition of physical activity, its importance in health and disease
- b. Assessment of physical activity (subjective and objective) through appropriate outcome measures

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- c. Methods to analyse body composition
- d. Exercise testing (aerobic, strength, flexibility)

5. Course Map (CO-PO-PSO Map)

Program Outcome / Course Outcome	PT 162 PO1	PT 162 PO2	PT 162 PO3	PT 162 PO4	PT 162 PO5
PT C 5 02 A CO1	3	2			
PT C 5 02 A CO2	3		3		
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution					

6. Course Teaching and Learning Methods

The Teaching and Learning Methods will include but not limited to:

Sl. No.	Teaching and Learning Methods	
1	Lectures	✓
2	Seminars	✓
3	Group discussions	✓
4	Self-directed Learning	✓
5	Journal review meetings	✓
6	Demonstrations and Skill Labs	
7	Case Discussion and Presentation	✓
8	Patient Care in various settings	✓
9	Field visits	
10	Inter disciplinary meetings and discussions	✓
11	Continuing Professional Development Programs	
12	Conferences / Workshop / Symposium programmes	✓
13	Research and Dissertation	

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7. Course Assessment and Reassessment

The details of the components and subcomponents of course assessment are presented in the Academic Regulations document pertaining to the Masters of Physiotherapy (MPT) Programme. The procedure to determine the final course marks is also presented in the Academic Regulations document.

8. Course Resources

Recommended Books

1. Walter T.ACSMs Clinical Exercise Physiology by Walter R Thompson, 10th ed .Lippincott Williams & Wilkins;2013
2. Kenney, W. Larry, Wilmore, Jack, Costill, David. Physiology of sports and exercise by Jack H.Willmore, Costill & Kenney,6th ed. .Human Kinetics; 2015
3. William D. McArdle, Frank I. Katch, Victor L. Katch .Exercise Physiology by Mac Ardle , Katch & Katch, 8th ed. Lippincott Williams & Wilkins;2015
4. ML Pollock. Pollock Heart Disease and rehabilitation by Pollock ML .Wiley–Blackwell.1979
5. James Watkins. Fundamental biomechanics of sport and exercise by James Watkins .Taylor & Francis.2014
6. Richards J.The Comprehensive Text Book of Clinical biomechanics by Jim Richards. 2nded. Elsevier;2018
7. A Pressler, Niebauer J.Text book of sports and exercise cardiology by Axel Pressler and Josef Niebauer. 1st ed. Springer International Publishing.2020
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Frownfelter, Elizabeth dean. Mosby Elsevier;1996

22. Downie AP, Cash JE .Cash's Textbook of Chest, Heart, and Vascular disorders for physiotherapists.4th ed.Mosby Elsevier;1987
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5. Experimental Diabetes Research
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8. Journal of Chronic Obstructive Pulmonary Disease
9. Journal of Exercise Physiology Online (J Exerc Physiol Online)
10. Lung India (Lung India)
11. Primary Care Diabetes
12. Primary care Respiratory Journal
13. Respiratory Research (Res.)
14. The Open Respiratory Medicine Journal
15. International Journal of Diabetes in Developing Countries
16. Clinics in Chest Medicine
17. Diabetes Research and Clinical Practice
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Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials:

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3. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. Circ Res. 2015;117(2):207-19.
4. Spruit M et al. An official American Thoracic Society /European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. Am J Respir Crit Care Med. 2013;188(8): e13-6

9. Course Organization

Course Code	PT C 5 02 A	
Course Title	Assessment Approaches and Diagnosis in Cardiovascular and Pulmonary Physiotherapy	
Course Leader's Name	Shaswat Verma	
Course Leader's Contact Details	Phone:	9886591748
	E-mail:	Shaswatverma.rcp@msruas.ac.in
Course Specifications Approval Date	26.09.2022	
Next Course Specifications Review Date	01.07.2024	
Subsequent Course Specifications Review Date		

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Course 4: Physiotherapy Interventions in Cardiovascular and Pulmonary Disorders

Course Title	Physiotherapy Interventions in Cardiovascular and Pulmonary Disorders
Course Code	PT C 5 03 A
Course Type	Core Theory Course
Department	Cardiovascular and pulmonary Sciences
College	Physiotherapy

1.Course Summary

This course enables the student to build up on their knowledge, skill and clinical experience by providing expertization in therapeutic and rehabilitation approaches of cardiovascular and respiratory dysfunctions. It also facilitates the student to learn good communication skills with the team of healthcare providers and stakeholders involved in comprehensive care of the patient.

2. Course Size and Credits:

Number of Credits	NA
Credit Structure (Lecture: Tutorial: Practical)	NA
Total Hours	As per Academic Regulations
Number of Weeks	As per Academic Regulations
Department Responsible	Cardiovascular and pulmonary sciences
Total Course Marks	100 + 100 (Theory + Practical)
Pass Criterion	As per the Academic Regulations
Attendance Requirement	As per the Academic Regulations

3. Course Outcomes (COs)

On completion of the course, the postgraduate student will be able to

- PT C 5 03 A CO1: Demonstrate clinical reasoning skills to enable effective examination of patients presenting with cardio vascular and respiratory disorders.
- PT C 5 03 A CO2: Interpret diagnostic imaging, exercise testing and other investigations required for physiotherapy clinical decision making in cardio vascular and pulmonary disorders.
- PT C 5 03 A CO3: Demonstrate the skills necessary to assess and identify impairments, activity limitations, and participatory restrictions through clinical reasoning using appropriate outcome measures in patients with cardio vascular and pulmonary disorders.
- PT C 5 03 A CO4: Display skill of communication, inter-disciplinary team work in various settings Of practice.

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1. **Cardio-pulmonary resuscitation, CPR- Basic Life Support Training**
2. **Comprehensive management of adults in critical care**
 - a. Understanding the differences in management of adult vs paediatric critical care
 - b. Care of the patient with artificial Airway
 - c. Management of ventilated conscious, ventilated unconscious, and patient not on ventilator
 - d. Body Mechanics and Positioning
 - e. Preventive Measures and Evidence based Practice
3. **Skills in Cardiovascular and pulmonary Physiotherapy**
 - a. Lung expansion therapy – methods and techniques to improve lung volumes and capacities
 - b. Bronchial Hygiene therapy – methods and techniques to clear secretions
 - c. Methods and techniques to decrease work of breathing
 - d. Endurance promotion activities
 - e. Energy conservation techniques
 - f. Oxygen therapy
4. **Cardio Pulmonary Rehabilitation**
 - a. Elements of International standards for a Cardiac/ Pulmonary rehabilitation Program: historic perspective, Definition and Goals, Physical reconditioning, scientific basis, Benefits and potential hazards, Patients evaluation and selection criteria and Recent Advances.
 - b. Smoking cessation and other risk factor modifications
5. **Exercise Prescription & Prevention in Non-Communicable Diseases**
 - a. Primary prevention of various Cardiovascular, Endocrine, Metabolic and Pulmonary diseases
 - b. Public health programs for cardiovascular and pulmonary diseases globally and in India.

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6. Recent Advances and Evidence-Based Practice

- a) Cardio-pulmonary rehabilitation
- b) Bronchial hygiene and airway clearance techniques
- c) Cardio-respiratory physiotherapy in special populations
- d) vascular disorders

5. Course Map (CO-PO-PSO Map)

Program Outcome / Course Outcome	PT 162 PO1	PT 162 PO2	PT 162 PO3	PT 162 PO4	PT 162 PO5
PT C 5 03 A CO1		3	3		
PT C 5 03 A CO2		2			
PT C 5 03 A CO3			3		
PT C 5 03 A CO4					2
3: Very Strong Contribution, 2: Strong Contribution, 1: Moderate Contribution					

6. Course Teaching and Learning Methods

The Teaching and Learning Methods will include but not limited to:

Sl. No.	Teaching and Learning Methods	
1	Lectures	✓
2	Seminars	✓
3	Group discussions	✓
4	Self-directed Learning	✓
5	Journal review meetings	✓
6	Demonstrations and Skill Labs	
7	Case Discussion and Presentation	✓
8	Patient Care in various settings	✓
9	Field visits	
10	Inter disciplinary meetings and discussions	✓
11	Continuing Professional Development Programs	✓
12	Conferences / Workshop / Symposium programmes	✓
13	Research and Dissertation	✓

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7. Course Assessment and Reassessment

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8. Course Resources

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4. ML Pollock. Pollock Heart Disease and rehabilitation by Pollock ML. Wiley-Blackwell. 1979
5. James Watkins. Fundamental biomechanics of sport and exercise by James Watkins. Taylor & Francis. 2014
6. Richards J. The Comprehensive Text Book of Clinical biomechanics by Jim Richards. 2nd ed. Elsevier; 2018
7. Axel Pressler, Niebauer J. Text book of sports and exercise cardiology by Axel Pressler and Josef Niebauer. 1st ed. Springer International Publishing. 2020
8. Durstine L, Moore GE, MJ La Monte, BA Franklin. Pollock's Textbook of Cardiovascular Disease and Rehabilitation by Larry Durstine, GE Moore. Human Kinetics; 2008.
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23. Froelicher V, Myers J .Exercise and the Heart (Cardiovascular Clinics s),5th ed.Elsevier;2006
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25. Myres SR. Saunders, Manual of Physical Therapy Practice. Saunders;1995

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7. Journal of Cardiopulmonary Rehabilitation and Prevention
8. Journal of Chronic Obstructive Pulmonary Disease
9. Journal of Exercise Physiology Online (J Exerc Physiol Online)
10. Lung India (Lung India)
11. Primary Care Diabetes
12. Primary care Respiratory Journal
13. Respiratory Research (Res.)
14. The Open Respiratory Medicine Journal
15. International Journal of Diabetes in Developing Countries
16. Clinics in Chest Medicine
17. Diabetes Research and Clinical Practice
18. British Journal of Diabetes and Vascular Disease
19. International Journal of Chronic Obstructive Pulmonary Disease (Int J Chron Obstruct Pulmon Dis)
20. Cardiopulmonary Physical Therapy Journal
21. Journal of Cardiac and Pulmonary Rehabilitation
22. Circulation
23. American Heart Journal
24. Journal of American Heart Association (JAHA)
25. International Journal of Cancer (IJC)
26. Journal of Cancer
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30. Supportive Care in Cancer
31. Asia Pacific Journal of Cancer Prevention



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Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials:

1. Lobelo F et al. Routine Assessment and Promotion of Physical Activity in Healthcare Settings: A Scientific Statement From the American Heart Association. Circulation. 2018;137(18): e495- e522
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3. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. Circ Res. 2015;117(2):207-19.
4. Spruit M et al. An official American Thoracic Society /European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation. Am J Respir Crit Care Med. 2013;188(8): e13-6

9. Course Organization

Course Code	PT C 5 03 A		
Course Title	Physiotherapy Interventions in Cardiovascular and Pulmonary Disorders		
Course Leader's Name	Shaswat Verma		
Course Leader's Contact Details	Phone:	9886591748	
	E-mail:	Shaswatverma.rcp@msruas.ac.in	
Course Specifications Approval Date	26.09.2022		
Next Course Specifications Review Date	01.07.2024		
Subsequent Course Specifications Review Date			

Annexure 1

Program electives

Biomedical research (PT E 5 01 A) - Encompasses application such as devices, drug trials which are not covered under research syllabus as they are not integral to the programme outcomes. This course aims to provide the student an opportunity to understand research applications in the fields of the bio-physical sciences as well as an insight into clinical research.

Basic Life Support (PT E 5 02 A) - As a clinician in the field, a physiotherapist is expected to be competent in all life saving procedures. As the syllabus is more focussed towards the practice of physiotherapeutics, this course shall ensure that a physiotherapist is competent to deliver basic life support in case of an emergency.

Approved by the Academic Council at its 26th Meeting held on 14th July 2022

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Furthermore, the certification is required to be a independent clinical practitioner.

Professional Ethics (PT E 5 03 A) – This module aims to augment the practice of ethics and professionalism as delivered in the main course. This course shall be done on a continuous basis along with other courses so as to leverage the experience gain by the students in clinical postings toward further development of professional ethics.

Open elective

Advanced Life Support (PT O 5 01 A)– This course aims to provide training on a set of life saving skills that extends beyond BLS. It is for health care professionals who either direct or participate in the management of cardiac emergencies such as cardiac arrest, stroke, myocardial infarction. It is provided by American Heart Association.

Medico legal aspects in patient care (PT O 5 02 A)– The course aims to equip the students in the basic understanding of medico legal jurisprudence so as to improve the understanding of the legal implications of day-to-day practice and the knowledge of consumer laws.

Quality management in health care (PT O 5 03 A)– This course aims to provide an overview of design, policies and processes that can minimize harm and optimize patient care and outcome.

Financial Literacy (PT O 5 04 A)– This course aims to provide the foundation for effective financial decision making with their financial resources. Financial literacy makes the student confident in understanding the concepts of saving, investing and debt that leads to an overall sense of financial well-being and self-trust.


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