



M.Sc. in Diabetic Sciences (2 Years, 4 Semesters)

Overview

The M.Sc. in Diabetic Sciences is a specialized postgraduate program designed to equip students with advanced knowledge and skills to manage, prevent, and treat diabetes and its complications. This interdisciplinary program integrates aspects of medicine, endocrinology, nutrition, and lifestyle management, preparing students to offer holistic care to diabetic patients.

Diabetes mellitus is a rapidly growing health concern worldwide, leading to complications affecting multiple organs. The program covers advanced topics in diabetes pathophysiology, clinical assessment, pharmacological and non-pharmacological management, patient education, and research methodologies. Graduates will be well-equipped for careers in clinical care, research, academia, and public health.

Affiliated Institution: School of Medical Sciences and Technology, Malla Reddy Vishwavidyapeeth (Deemed to be University)

Eligibility: A pass in B.Sc. (Life Sciences, Nutrition, Biochemistry, or related fields) with at least 50% marks in the qualifying examination.

Key Highlights

- **Comprehensive Diabetes Care** – Covers management of Type 1, Type 2, and gestational diabetes, as well as diabetes-related complications.
- **Multidisciplinary Approach** – Training involves collaboration with endocrinologists, dietitians, physiotherapists, and psychologists.
- **Clinical Exposure** – Practical training in diabetes clinics, hospitals, and research labs.
- **Advanced Diagnostic Techniques** – Emphasizes glycemic monitoring, insulin therapy, and emerging treatment modalities.
- **Research and Evidence-Based Practice** – Students learn to conduct research in diabetes prevention, treatment, and lifestyle interventions.

Course Curriculum

The program spans two years, comprising theoretical coursework, practical training, clinical internships, and research projects.

Year 1

Core Modules:

- **Fundamentals of Diabetology** – Overview of diabetes pathophysiology, epidemiology, and classification.



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- **Clinical Assessment & Diagnosis of Diabetes** – Methods for diagnosing and monitoring diabetes and its complications.
- **Diabetes Pharmacotherapy** – Study of anti-diabetic medications, insulin therapy, and emerging drug therapies.
- **Nutritional and Lifestyle Management in Diabetes** – Role of diet, exercise, and behavioral interventions.
- **Endocrinology & Metabolic Disorders** – Understanding the interplay of hormonal regulation and metabolic diseases.
- **Diabetes Education & Self-Management** – Training in patient education strategies and behavioral modification techniques.

Clinical Training:

- Hands-on experience in diabetes clinics and endocrinology units.

Year 2

Advanced Modules:

- **Diabetes Complications & Management** – Neuropathy, nephropathy, retinopathy, cardiovascular diseases.
- **Gestational Diabetes & Pediatric Diabetes** – Special considerations in maternal and child health.
- **Emerging Therapies in Diabetes** – Regenerative medicine, artificial pancreas, genetic interventions.
- **Psychosocial Aspects of Diabetes Care** – Psychological impact, patient adherence, and counseling.
- **Research Methodology & Biostatistics in Diabetes** – Conducting clinical research and analyzing data.
- **Healthcare Policies & Public Health Approaches to Diabetes** – Prevention and management strategies at a population level.

Dissertation & Research Project:

- Independent research on diabetes management, innovation, or public health interventions.

Internships & Clinical Practice:

- Specialized training in diabetic foot clinics, metabolic research centers, and lifestyle intervention programs.

Career and Academic Opportunities

Career Opportunities:



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- **Diabetologist** – Specialist in diabetes care and management.
- **Clinical Diabetes Educator** – Teaching patients effective self-management techniques.
- **Endocrinology Researcher** – Conducting studies on diabetes treatments and prevention.
- **Diabetes Specialist Nurse** – Providing patient care in hospitals, clinics, and home settings.
- **Nutritionist & Dietitian (Diabetes Management)** – Advising patients on meal planning and lifestyle modifications.
- **Public Health & Policy Consultant** – Developing national and global diabetes prevention programs.
- **Pharmaceutical & Medical Device Specialist** – Working in insulin pump technology and diabetes drug development.

Higher Education & Research Prospects:

- **Ph.D. in Diabetes & Metabolic Disorders** – Advanced research in endocrinology and diabetes care.
- **Fellowship in Diabetology or Endocrinology** – Further specialization in diabetes management.
- **Master of Public Health (MPH) in Diabetes Prevention** – Focusing on epidemiology and policy.

Labs & Training Facilities

- **Diabetes Assessment & Diagnostics Lab** – Advanced biochemical and glucose monitoring techniques.
- **Endocrinology & Metabolism Lab** – Research in metabolic disorders and insulin resistance.
- **Diabetes Nutrition & Lifestyle Lab** – Evaluating dietary interventions and exercise physiology.
- **Diabetes Complications & Vascular Health Lab** – Studying cardiovascular and neuropathic complications.
- **Clinical Research & Biostatistics Lab** – Conducting trials on diabetes interventions.
- **Foot Care & Wound Healing Lab** – Studying diabetic foot ulcers and preventive care strategies.



PROGRAM OUTCOMES (POs)

PO	Program Outcomes
PO-1	In-depth Knowledge of Diabetes Develop advanced knowledge of diabetes pathophysiology, classification, epidemiology, and associated metabolic disorders.
PO-2	Clinical Expertise in Diagnosis & Management Gain proficiency in diagnosing, monitoring, and managing diabetes using evidence-based practices, including pharmacological and non-pharmacological interventions.
PO-3	Research & Innovation in Diabetes Care Conduct research in diabetic sciences, analyze clinical data, and contribute to innovative treatment approaches for diabetes prevention and management.
PO-4	Interdisciplinary Approach to Diabetes Management Collaborate with healthcare professionals, including endocrinologists, dietitians, and physiotherapists, to ensure holistic diabetes care and patient education.
PO-5	Technology & Digital Health in Diabetes Care Utilize emerging technologies such as continuous glucose monitoring, insulin pumps, telemedicine, and artificial intelligence to enhance diabetes management.
PO-6	Ethical and Professional Responsibilities Demonstrate ethical responsibility in diabetes care, ensuring patient confidentiality, adherence to guidelines, and commitment to lifelong learning and professional growth.



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COURSE STRUCTURE – M.Sc. DIABETIC SCIENCES

SEMESTER – I

Sl. No.	Broad Category	Course Code	Name of the Subject/Practical	Contact hours/week			Credits
				L	T	P	
1.	Major (Core)	MSDS101	Epidemiology, Classification and Pathophysiology of Diabetes	2	1	0	3
2.		MSDS102	Clinical Diagnosis & Laboratory Investigations in Diabetes	2	0	2	3
3.		MSDS103	Pharmacological and Non-Pharmacological Management of Diabetes	2	1	0	3
4.		MSDS104	Complications of Diabetes and Prevention Strategies	2	1	0	3
5.	Minor Select any two minor courses, each worth 3 credits, for a maximum of 6 credits per semester	MSDS105	1. Psychosocial Aspects of Diabetes Management 2. Technological Advances in Diabetes Care	2	0	2	6
			3. Public Health Aspects of Diabetes 4. Research Methodology & Biostatistics 5. Metabolic Disorders in Diabetes	2	0	2	
6.	Skill Enhancement Courses	MSDS106	1. Clinical Laboratory Techniques in Diabetes	0	0	2	2
			2. Diabetes Patient Counseling and Lifestyle Modification	0	0	2	
Total				12	3	10	20
Total Contact Hours				25			



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Course Outcomes for M.Sc. Diabetic Sciences MAJOR-Epidemiology, Classification, and Pathophysiology of Diabetes

Sr. No.	Course Outcome	Description
1	Understand the Epidemiology of Diabetes	Explain the global prevalence and distribution of diabetes, including risk factors, social determinants of health, and its impact on aging populations.
2	Classify Different Types of Diabetes	Identify and describe the differences between Type 1, Type 2, gestational, and other forms of diabetes, along with their etiology and clinical manifestations.
3	Analyze the Pathophysiology of Diabetes	Explain the biological mechanisms of diabetes, including insulin resistance, beta-cell dysfunction, and the role of genetics in disease development.
4	Understand the Role of Genetics and Environment in Diabetes	Discuss how genetic predisposition and environmental factors (such as lifestyle and diet) contribute to the development and progression of diabetes.
5	Analyze the Complications of Diabetes	Understand the acute and chronic complications of diabetes, including cardiovascular disease, neuropathy, nephropathy, and retinopathy.
6	Explain the Impact of Diabetes on Aging	Explore how aging influences the onset and progression of diabetes and its associated complications in elderly populations.
7	Explore the Diagnostic Criteria and Management of Diabetes	Describe the methods for diagnosing diabetes, including fasting blood glucose, HbA1c, and oral glucose tolerance test, and discuss current management strategies.
8	Apply Knowledge of Diabetes in Geriatric Care	Integrate epidemiological and pathophysiological knowledge in managing and preventing diabetes-related health issues in older adults, with an emphasis on personalized care.

Course Outcomes for M.Sc. Diabetic Sciences MAJOR-Clinical Diagnosis & Laboratory Investigations in Diabetes

Sr. No.	Course Outcome	Description
1	Understand the Clinical Symptoms and Signs of Diabetes	Identify the common symptoms of diabetes, including polyuria, polydipsia, polyphagia, and weight loss, and understand their relevance in diagnosing diabetes.



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Sr. No.	Course Outcome	Description
2	Explain the Role of Medical History in Diabetes Diagnosis	Discuss the importance of a thorough medical history, including family history, lifestyle factors, and comorbid conditions, in the clinical diagnosis of diabetes.
3	Describe the Diagnostic Criteria for Diabetes	Explain the key diagnostic tests used for diabetes diagnosis, including fasting blood glucose, oral glucose tolerance test (OGTT), and HbA1c, and their thresholds.
4	Analyze the Use of Laboratory Investigations in Diabetes Management	Discuss various laboratory tests used in the management and monitoring of diabetes, such as lipid profile, kidney function tests, and urinalysis.
5	Understand the Role of Glycemic Monitoring in Diabetes	Describe the different methods of glycemic monitoring, including self-monitoring of blood glucose (SMBG), continuous glucose monitoring (CGM), and HbA1c.
6	Discuss the Role of Imaging in Diagnosing Diabetes Complications	Explore the role of imaging techniques (e.g., retinal exams, ultrasound, and CT scans) in diagnosing and monitoring diabetes-related complications.
7	Explain the Role of Biomarkers in Diabetes Diagnosis	Identify emerging biomarkers for early detection of diabetes and its complications, such as inflammatory markers and biomarkers for insulin resistance.
8	Apply Clinical Diagnosis and Laboratory Investigations in Geriatric Care	Integrate diagnostic tools and laboratory investigations in the clinical management of diabetes in older adults, considering factors like comorbidities, polypharmacy, and age-related changes in lab results.

Course Outcomes for M.Sc. Diabetic Sciences MAJOR-Pharmacological and Non-Pharmacological Management of Diabetes

Sr. No.	Course Outcome	Description
1	Understand the Goals of Diabetes Management	Explain the overall goals of diabetes management, including achieving optimal blood glucose control, preventing complications, and improving quality of life.
2	Describe the Pharmacological Treatment Options for Diabetes	Identify and explain the classes of medications used in diabetes management, such as insulin, oral hypoglycemics (e.g., metformin, sulfonylureas), GLP-1 agonists, SGLT2 inhibitors, and newer therapies.
3	Analyze the Mechanism of Action and Side Effects of Diabetes Medications	Understand how different diabetes medications work (e.g., insulin, oral agents) and their potential side effects, including hypoglycemia, gastrointestinal issues, and long-term risks.



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Sr. No.	Course Outcome	Description
4	Discuss Insulin Therapy in Diabetes Management	Describe the types of insulin (e.g., rapid-acting, long-acting), their role in diabetes management, dosing strategies, and the importance of insulin titration.
5	Understand the Role of Non-Pharmacological Approaches in Diabetes Management	Explain the importance of lifestyle modifications, including diet, physical activity, weight management, and stress reduction, in the management of diabetes.
6	Explore the Role of Diet and Nutrition in Diabetes Control	Discuss dietary interventions, including carbohydrate counting, low glycemic index foods, and the role of nutrition counseling in achieving blood glucose control.
7	Analyze the Role of Physical Activity in Diabetes Management	Explain the benefits of regular physical activity in managing blood glucose levels, improving insulin sensitivity, and reducing cardiovascular risk in diabetic patients.
8	Integrate Pharmacological and Non-Pharmacological Strategies in Geriatric Care	Apply both pharmacological and non-pharmacological interventions in the management of diabetes in older adults, considering factors like polypharmacy, frailty, and age-related physiological changes.

Course Outcomes for M.Sc. Diabetic Sciences MAJOR-Complications of Diabetes and Prevention Strategies

Sr. No.	Course Outcome	Description
1	Understand the Acute Complications of Diabetes	Identify and describe the acute complications of diabetes, including diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic state (HHS), and hypoglycemia.
2	Analyze the Chronic Complications of Diabetes	Discuss the long-term complications of diabetes, including cardiovascular disease, diabetic retinopathy, neuropathy, nephropathy, and diabetic foot.
3	Explore the Pathophysiology of Diabetes Complications	Explain the underlying mechanisms that contribute to diabetes complications, such as microvascular and macrovascular damage, oxidative stress, and inflammation.
4	Discuss the Role of Glycemic Control in Preventing Complications	Describe the importance of maintaining optimal blood glucose control to reduce the risk and progression of diabetes-related complications.
5	Explain the Prevention and Early Detection of Diabetic Retinopathy	Discuss strategies for preventing and detecting diabetic retinopathy, including regular eye exams, glycemic control, and the use of laser treatment or injections.



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Sr. No.	Course Outcome	Description
6	Explore Preventive Measures for Diabetic Neuropathy	Identify strategies to prevent and manage diabetic neuropathy, such as controlling blood sugar levels, foot care, and pain management.
7	Discuss the Prevention of Diabetic Kidney Disease (Nephropathy)	Explain the importance of early detection of diabetic nephropathy and the role of blood pressure control, optimal glucose management, and ACE inhibitors in preventing kidney damage.
8	Implement Preventive Strategies for Cardiovascular and Foot Complications	Analyze strategies to prevent cardiovascular disease in diabetics, such as lifestyle modifications, lipid control, and blood pressure management, as well as foot care to prevent ulcers and amputations.
9	Integrate Prevention Strategies in Geriatric Care	Apply diabetes complication prevention strategies in older adults, considering factors such as polypharmacy, frailty, and the presence of comorbid conditions.

Course Outcomes for M.Sc. Diabetic Sciences MINOR-Psychosocial Aspects of Diabetes Management:

Sr. No.	Course Outcome	Description
1	Understand the Psychological Impact of Diabetes	Discuss the emotional and psychological challenges faced by individuals with diabetes, including stress, anxiety, depression, and diabetes-related distress.
2	Explore the Role of Self-Management in Diabetes	Examine how self-management behaviors, including blood glucose monitoring, medication adherence, and lifestyle changes, are influenced by psychological factors.
3	Analyze the Impact of Diabetes on Family and Caregivers	Discuss the role of family and caregivers in diabetes management, the emotional burden on caregivers, and how to support family members in managing the condition.
4	Identify the Link Between Diabetes and Mental Health Disorders	Explain the relationship between diabetes and mental health disorders, such as depression, anxiety, and eating disorders, and how these conditions affect diabetes management.
5	Understand the Role of Social Support in Diabetes Management	Explore how social support systems, including friends, support groups, and healthcare professionals, contribute to effective diabetes management and adherence to treatment.



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Sr. No.	Course Outcome	Description
6	Discuss the Impact of Diabetes on Quality of Life	Investigate how diabetes affects quality of life, including physical health, emotional well-being, social relationships, and daily functioning.
7	Examine the Cultural and Socioeconomic Factors in Diabetes Care	Understand how cultural beliefs, socioeconomic status, and access to healthcare influence diabetes management and patient outcomes.
8	Implement Strategies to Address Psychosocial Issues in Diabetes Management	Apply psychosocial interventions such as counseling, cognitive behavioral therapy (CBT), stress management, and motivational interviewing to improve diabetes care and patient outcomes.
9	Integrate Psychosocial Aspects in Geriatric Diabetes Care	Address the unique psychosocial needs of older adults with diabetes, considering factors like loneliness, cognitive decline, and the emotional challenges of managing a chronic condition in aging.

Course Outcomes for M.Sc. Diabetic Sciences MINOR-Technological Advances in Diabetes Care

Sr. No.	Course Outcome	Description
1	Understand the Role of Technology in Diabetes Management	Explore the importance of technological innovations in improving the management of diabetes, including monitoring, treatment, and patient education.
2	Analyze the Impact of Continuous Glucose Monitoring (CGM)	Discuss how CGM systems work, their benefits in real-time blood glucose tracking, and their role in preventing complications and improving glycemic control.
3	Explain the Use of Insulin Pumps in Diabetes Management	Describe the role of insulin pumps in delivering continuous insulin therapy, the different types of pumps, and how they improve insulin management and patient lifestyle.
4	Explore the Benefits of Mobile Health (mHealth) Applications	Discuss how mobile apps, wearable devices, and telemedicine platforms support diabetes management by tracking glucose levels, medication adherence, physical activity, and diet.
5	Examine the Role of Artificial Intelligence (AI) and Machine Learning in Diabetes Care	Explain how AI and machine learning are being utilized for predictive analytics, personalized treatment plans, and the optimization of insulin therapy and glucose control.
6	Explore the Role of Telemedicine in Diabetes Management	Discuss the rise of telemedicine in diabetes care, including remote consultations, monitoring, and education, and its impact on access to care and patient outcomes.



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Sr. No.	Course Outcome	Description
7	Understand the Role of Smart Insulin Pens and Inhalable Insulin	Explore the advancements in insulin delivery systems, including smart insulin pens that track doses and inhalable insulin, and how these innovations improve convenience and patient compliance.
8	Discuss the Use of Artificial Pancreas Systems	Explain the function of artificial pancreas systems, which combine insulin pumps with CGMs, and their potential in automating blood glucose management for people with Type 1 diabetes.
9	Integrate Technological Advances in Geriatric Diabetes Care	Apply technological advancements in managing diabetes in older adults, focusing on user-friendly devices, remote monitoring, and the consideration of age-related changes in technology use.
10	Explore Future Trends in Diabetes Technology	Discuss upcoming technological innovations in diabetes care, including advancements in bioengineering, gene therapy, and new drug delivery systems, and their potential impact on the future of diabetes management.

Course Outcomes for M.Sc. Diabetic Sciences MINOR-Public Health Aspects of Diabetes

Sr. No.	Course Outcome	Description
1	Understand the Global Prevalence and Burden of Diabetes	Discuss the global prevalence of diabetes, its impact on public health systems, and the growing burden of diabetes-related complications in different populations.
2	Analyze the Risk Factors for Diabetes at the Population Level	Explore the major risk factors for diabetes, including lifestyle behaviors (diet, physical activity), genetics, socio-economic status, and environmental influences, and their impact on public health.
3	Examine the Social Determinants of Diabetes	Investigate how social determinants such as access to healthcare, education, employment, and living conditions contribute to the development and management of diabetes.
4	Discuss the Economic Impact of Diabetes on Health Systems	Analyze the direct and indirect costs associated with diabetes, including healthcare expenses, lost productivity, and long-term care costs, and the strain on public health systems.
5	Explore Public Health Policies for Diabetes Prevention	Discuss national and global public health policies aimed at preventing diabetes, such as promoting healthy eating, physical activity, and public education campaigns.



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Sr. No.	Course Outcome	Description
6	Understand the Role of Screening and Early Detection in Public Health	Explain the importance of population-based screening programs for early detection of diabetes and pre-diabetes to reduce the risk of complications and improve public health outcomes.
7	Discuss Diabetes Prevention and Management Programs	Explore various diabetes prevention and management programs at the community and national levels, including lifestyle interventions, education, and support groups.
8	Explore the Role of Healthcare Professionals in Public Health Diabetes Management	Discuss the role of healthcare providers (physicians, nurses, dietitians) in promoting diabetes prevention, management, and education within public health frameworks.
9	Analyze the Impact of Diabetes on Vulnerable Populations	Investigate the disproportionate burden of diabetes on certain groups, such as low-income communities, ethnic minorities, and older adults, and strategies for targeting interventions.
10	Discuss the Role of Health Communication and Education in Diabetes	Explore the importance of effective health communication strategies and diabetes education in empowering individuals and communities to prevent and manage the disease.
11	Implement Diabetes Public Health Strategies in Geriatric Care	Apply public health strategies to address diabetes prevention and management in older adults, considering factors like frailty, cognitive decline, and multimorbidity.

Course Outcomes for M.Sc. Diabetic Sciences MINOR-Research Methodology & Biostatistics

Sr. No.	Course Outcome	Description
1	Understand the Basics of Research Methodology	Discuss the fundamental principles of research methodology, including research design, types of studies (e.g., observational, experimental), and the role of research in healthcare.
2	Identify the Key Elements of a Research Proposal	Explore the components of a research proposal, including hypothesis formulation, objectives, literature review, study design, data collection methods, and ethical considerations.
3	Discuss the Types of Research Studies in Healthcare	Identify and describe different research designs used in healthcare, including cross-sectional, cohort, case-control, randomized controlled trials (RCTs), and systematic reviews.



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Sr. No.	Course Outcome	Description
4	Understand Sampling Techniques and Study Populations	Explain the concepts of sampling, types of sampling methods (e.g., random, stratified, convenience), and the importance of sample size determination and population selection.
5	Analyze Data Collection Methods in Research	Discuss various data collection techniques used in healthcare research, such as surveys, interviews, clinical assessments, laboratory tests, and secondary data analysis.
6	Understand Ethical Issues in Research	Examine the ethical principles in research, including informed consent, confidentiality, research integrity, and the role of institutional review boards (IRBs) in safeguarding participants.
7	Introduction to Biostatistics and Its Application in Healthcare	Discuss the importance of biostatistics in healthcare research, focusing on descriptive statistics, measures of central tendency, variability, and frequency distributions.
8	Explore Inferential Statistics in Research	Explain the principles of inferential statistics, including hypothesis testing, p-values, confidence intervals, t-tests, chi-square tests, and ANOVA, and their applications in healthcare studies.
9	Analyze Correlation and Regression in Healthcare Research	Describe how correlation and regression analyses are used to examine relationships between variables, predict outcomes, and assess the strength of associations in medical research.
10	Discuss the Use of Statistical Software in Biostatistics	Introduce commonly used statistical software (e.g., SPSS, R, SAS) and discuss how researchers can use these tools for data analysis, interpretation, and reporting in healthcare studies.
11	Interpret and Present Research Findings	Discuss how to interpret research findings, including the importance of critical appraisal, drawing conclusions, and presenting results in a clear and concise manner for publication or policy.
12	Apply Research Methodology and Biostatistics in Geriatric Health	Apply research methodologies and biostatistical techniques in the study of aging and geriatric health, considering the unique challenges in this population (e.g., comorbidities, ethical considerations).

Course Outcomes for M.Sc. Diabetic Sciences MINOR-Metabolic Disorders in Diabetes

Sr. No.	Course Outcome	Description
1	Understand the Metabolic Pathophysiology of Diabetes	Explain the metabolic processes involved in the development of diabetes, including insulin resistance,



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Sr. No.	Course Outcome	Description
		impaired glucose metabolism, and the role of the pancreas in glucose regulation.
2	Analyze the Role of Insulin Resistance in Metabolic Disorders	Discuss the concept of insulin resistance, its development in Type 2 diabetes, and its impact on glucose homeostasis, lipid metabolism, and overall metabolic health.
3	Explore the Link Between Diabetes and Dyslipidemia	Investigate the relationship between diabetes and abnormal lipid levels, including increased triglycerides, reduced HDL cholesterol, and the increased risk of cardiovascular disease.
4	Discuss the Role of Obesity in Diabetes and Metabolic Syndrome	Examine how obesity contributes to the development of diabetes and metabolic syndrome, including the role of adipose tissue in inflammation, insulin resistance, and hormonal imbalances.
5	Explain the Relationship Between Diabetes and Hypertension	Explore how diabetes and hypertension are often comorbid conditions, their combined impact on cardiovascular risk, and strategies for managing both in diabetic patients.
6	Investigate the Pathophysiology of Diabetic Ketoacidosis (DKA)	Discuss the biochemical mechanisms behind DKA, its risk factors, clinical presentation, and management strategies, particularly in Type 1 diabetes.
7	Explore Non-Alcoholic Fatty Liver Disease (NAFLD) in Diabetes	Discuss the prevalence and pathophysiology of NAFLD in diabetic patients, its association with insulin resistance, and its potential progression to non-alcoholic steatohepatitis (NASH) and cirrhosis.
8	Understand the Impact of Diabetes on Bone and Mineral Metabolism	Analyze how diabetes affects bone mineral density and the risk of fractures, and explore the relationship between diabetes, calcium, phosphate metabolism, and osteoporosis.
9	Discuss the Role of Inflammation in Diabetes and Metabolic Disorders	Examine the role of chronic low-grade inflammation in the development and progression of diabetes and metabolic disorders, and how this contributes to complications like cardiovascular disease.
10	Explore the Relationship Between Diabetes and Polycystic Ovary Syndrome (PCOS)	Investigate the connection between diabetes and PCOS, focusing on insulin resistance, reproductive hormone imbalances, and the increased risk of metabolic syndrome in affected individuals.



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Sr. No.	Course Outcome	Description
11	Discuss the Management of Metabolic Disorders in Diabetes	Review the pharmacological and non-pharmacological management strategies for addressing metabolic disorders associated with diabetes, including lifestyle interventions, medications, and monitoring.
12	Integrate Metabolic Disorder Management in Geriatric Diabetes Care	Discuss the challenges and considerations in managing metabolic disorders in older adults with diabetes, including polypharmacy, comorbidities, and age-related changes in metabolism.

Course Structure & Syllabus

Total Course Duration: 2 Years (4 Semesters)

Total Credits: 80

Total Teaching & Training Hours: ~3,600

Assessment Methods

Assessment Component	Weightage (%)	Details
Continuous Internal Assessment (CIA)	40%	Includes internal exams, assignments, presentations, case studies, and practical performance
End-Semester Examination (ESE)	60%	Divided into theory (40%) and practical (20%)
Mid-Semester Exams	20% (Part of CIA)	Two internal tests per semester
Assignments & Case Studies	5% (Part of CIA)	Research-based assignments, literature reviews, clinical case reports
Seminars & Presentations	5% (Part of CIA)	Oral/poster presentations on diabetes management
Practical Performance & Clinical Evaluation	5% (Part of CIA)	Skill-based assessments in labs/hospitals



Assessment Component	Weightage (%)	Details
Attendance & Participation	5% (Part of CIA)	Regularity in theory & practical sessions
Theory Examination (Final)	40% (Part of ESE)	Structured written paper covering subject knowledge
Practical Examination (Final)	20% (Part of ESE)	Includes viva, skill demonstration, case handling
Dissertation/Research Project	Mandatory	Evaluated in the final year by internal & external examiners
Clinical Internship/Training	Pass/Fail	Logbook-based evaluation with hospital mentor review

Marking System & Grading

Marks (%)	Grade	Grade Point (GPA/CGPA Equivalent)	Classification
90 - 100	O (Outstanding)	10	First Class with Distinction
80 - 89	A+ (Excellent)	9	First Class with Distinction
70 - 79	A (Very Good)	8	First Class
60 - 69	B+ (Good)	7	First Class
50 - 59	B (Satisfactory)	6	Second Class
<50 (Fail)	F (Fail)	0	Fail (Re-exam Required)

Pass Criteria:

- **Minimum 50% marks in each subject** (Theory & Practical separately).
- **Aggregate of 55% required for progression** to the next semester.
- **No more than two backlogs** allowed for promotion to the final year.

Exam Pattern for Theory & Practical

A. Theory Examination Pattern



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Total Marks: 100 (Converted to 40% for End-Semester Assessment)

Duration: 3 Hours

Section	Question Type	No. of Questions	Marks per Question	Total Marks
Section A	Short Answer Type (SAQ)	10 (Attempt all)	2	20
Section B	Long Answer Type (LAQ)	5 (Attempt any 4)	10	40
Section C	Case-Based/Clinical Scenario	3 (Attempt any 2)	15	30
Section D	MCQs/Objective Type	10 (Compulsory)	1	10
Total				100

Weightage:

- Pathophysiology & Biochemistry of Diabetes – 40%
- Clinical Management & Pharmacology – 30%
- Research & Case Studies – 20%
- Public Health & Preventive Strategies – 10%

Passing Criteria: Minimum 50% (50/100 marks)

B. Practical Examination Pattern

Total Marks: 100 (Converted to 20% for End-Semester Assessment)

Duration: 4–6 Hours

Component	Marks Distribution
Clinical Case Presentation & Diabetes Assessment	30
OSCE (Objective Structured Clinical Examination) – Skill Demonstration	25
Diet & Lifestyle Counseling for Diabetic Patients	20
Lab-Based Examination (Blood Glucose Monitoring, HbA1c Test, Lipid Profile Analysis)	15
Record Work (Logbook & Assignments)	10
Total	100

OSCE (Skill-based Assessment) includes stations on:

- Blood Glucose Monitoring & Insulin Administration
- Diabetic Foot Examination & Neuropathy Testing



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- Meal Planning & Nutrition Counseling for Diabetic Patients
- Interpretation of HbA1c & Lipid Profile Reports

Passing Criteria: Minimum 50% (50/100 marks) in practicals.

Recommended Books & E-Resources

Textbooks

- "Joslin's Diabetes Mellitus" – C. Ronald Kahn
- "International Textbook of Diabetes Mellitus" – Ralph A. DeFronzo
- "Diabetes in Practice: Management & Treatment" – Anne Dornhorst
- "Endocrinology & Diabetes: Clinical Cases Uncovered" – John Wass

E-Resources & Journals

- Journal of Diabetes Research
- American Diabetes Association (ADA) Guidelines
- World Health Organization (WHO) Diabetes Reports

Conclusion

The M.Sc. in Diabetic Sciences is designed for healthcare professionals seeking expertise in diabetes care, prevention, and research. With an increasing prevalence of diabetes worldwide, graduates have numerous career opportunities in clinical practice, research, public health, and pharmaceutical industries. The program ensures a strong foundation in diabetes science, clinical skills, and interdisciplinary approaches, equipping graduates to make a significant impact in the field of endocrinology and metabolic health.