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

**Overview**

The M.Sc. in Geriatric Sciences is a specialized postgraduate program designed to equip students with advanced knowledge and skills to provide comprehensive healthcare and support for the elderly. This interdisciplinary program integrates aspects of medicine, physiotherapy, nursing, psychology, nutrition, and social work, preparing graduates to address the complex health and social needs of aging populations.

With the global increase in the elderly population, the demand for skilled geriatric care professionals is on the rise. The program focuses on age-related diseases, functional assessment, mental health, rehabilitation, palliative care, and elder-friendly healthcare systems. Graduates will be well-prepared for careers in healthcare, policy-making, research, and elder care management.

**Affiliated Institution:** School of Medical Sciences and Technology, Malla Reddy Vishwavidyapeeth (Deemed to be University)
**Eligibility:** A pass in B.Sc. (Life Sciences, Nursing, Physiotherapy, Social Work, or related fields) with at least 50% marks in the qualifying examination.

**Key Highlights**

- **Holistic Geriatric Care** – Covers physical, mental, and social well-being of the elderly.
- **Multidisciplinary Approach** – Collaboration with geriatricians, physiotherapists, psychologists, and social workers.
- **Clinical Exposure** – Hands-on training in geriatric clinics, rehabilitation centers, and hospitals.
- **Advanced Diagnostic & Therapeutic Techniques** – Geriatric assessment, pharmacotherapy, rehabilitation, and assistive technologies.
- **Research and Evidence-Based Practice** – Conducting research on aging, geriatric syndromes, and long-term care.

**Course Curriculum**

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

**Year 1**

**Core Modules:**

- **Fundamentals of Geriatric Medicine** – Introduction to aging physiology and gerontology.
- **Geriatric Assessment & Functional Evaluation** – Methods for cognitive, physical, and social assessment.
- **Geriatric Pharmacology & Polypharmacy** – Medication management and drug interactions in older adults.
- **Nutritional & Lifestyle Interventions for Elderly** – Dietary modifications, physical activity, and lifestyle management.
- **Mental Health & Neurodegenerative Disorders in Aging** – Dementia, depression, and age-related cognitive decline.
- **Elderly Care & Support Systems** – Home-based care, assisted living, and community resources.

**Clinical Training:**

- Practical training in geriatric assessment units and elderly care facilities.

**Year 2**

**Advanced Modules:**

- **Chronic Disease Management in Geriatrics** – Hypertension, diabetes, osteoporosis, arthritis.
- **Rehabilitation & Physiotherapy in Aging** – Fall prevention, mobility enhancement, and assistive devices.
- **Palliative & End-of-Life Care for Elderly** – Pain management, ethical decision-making, and family support.
- **Social & Psychological Aspects of Aging** – Elder abuse, social isolation, and mental well-being.
- **Research Methodology & Biostatistics in Geriatrics** – Conducting geriatric studies and analyzing data.
- **Healthcare Policies & Geriatric Public Health** – Policies for aging populations and geriatric healthcare models.

**Dissertation & Research Project:**

- Independent research on aging, elder care interventions, or public health policies.

**Internships & Clinical Practice:**

- Specialized training in geriatric hospitals, long-term care centers, and rehabilitation clinics.

## Career and Academic Opportunities

### Career Opportunities:

- **Geriatrician** – Specialist in elderly healthcare and chronic disease management.
- **Geriatric Nurse or Physiotherapist** – Providing care for mobility, rehabilitation, and chronic conditions.
- **Elder Care Consultant** – Advising on elder-friendly healthcare solutions and policies.
- **Clinical Psychologist (Geriatrics)** – Addressing cognitive decline, dementia, and depression in older adults.
- **Social Worker in Geriatric Care** – Providing social and emotional support to elderly individuals.
- **Researcher in Aging & Elderly Health** – Conducting studies on geriatric health and interventions.
- **Geriatric Healthcare Administrator** – Managing nursing homes, assisted living facilities, and rehabilitation centers.

### Higher Education & Research Prospects:

- **Ph.D. in Geriatric Medicine & Aging Studies** – Advanced research in elderly healthcare.
- **Fellowship in Geriatrics or Palliative Care** – Specialization in age-related diseases and end-of-life care.
- **Master of Public Health (MPH) in Aging & Elderly Care** – Focusing on aging policies and healthcare systems.

### Labs & Training Facilities

- **Geriatric Assessment & Cognitive Testing Lab** – Evaluating memory, cognition, and functional abilities.
- **Pharmacology & Polypharmacy Lab** – Researching drug interactions and personalized medicine for elderly patients.
- **Geriatric Nutrition & Lifestyle Intervention Lab** – Studying the impact of diet and exercise on aging.
- **Rehabilitation & Assistive Technology Lab** – Examining mobility aids, prosthetics, and adaptive devices.
- **Mental Health & Dementia Research Lab** – Investigating neurodegenerative disorders and mental health interventions.
- **Clinical Research & Biostatistics Lab** – Conducting gerontology-focused research and statistical analysis.

# PROGRAM OUTCOMES (POs)

| PO | Program Outcomes |
|---|---|
| **PO-1** | Demonstrate expertise in the physiological, psychological, and social aspects of aging. |
| **PO-2** | Apply evidence-based approaches to improve healthcare and quality of life for the elderly. |
| **PO-3** | Develop interdisciplinary strategies for geriatric care, rehabilitation, and chronic disease management. |
| **PO-4** | Utilize research methodologies to analyze and address aging-related health challenges. |
| **PO-5** | Implement policies and ethical guidelines for elderly healthcare and support systems. |
| **PO-6** | Foster communication and advocacy skills to promote geriatric well-being in society. |

**COURSE STRUCTURE – M.Sc. Geriatric Sciences**

**SEMESTER – I**

| Sl. No. | Broad Category | Course Code | Name of the Subject/Practical | Contact hours/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | L | T | P | |
| 1. | **Major (Core)** | MSGS101 | Gerontology and Aging Biology | 2 | 1 | 0 | 3 |
| 2. | | MSGS102 | Geriatric Medicine and Clinical Assessment | 2 | 0 | 2 | 3 |
| 3. | | MSGS103 | Common Geriatric Disorders and Management | 2 | 1 | 0 | 3 |
| 4. | | MSGS104 | Nutrition and Lifestyle Interventions in Aging | 2 | 1 | 0 | 3 |
| 5. | **Minor** Select any two minor courses, | MSGS105 | 1. Psychosocial Aspects of Aging | 2 | 0 | 2 | 6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | each worth 3 credits, for a maximum of 6 credits per semester | | 2. Technological Innovations in Elderly Care<br>3. Geriatric Pharmacology<br>4. Geriatric Rehabilitation and Assistive Technologies<br>5. Research Methodology & Biostatistics | 2 | 0 | 2 | |
| 6. | **Skill Enhancement Courses** | MSGS106 | 1. Cognitive and Mental Health Assessment in Elderly | 0 | 0 | 2 | 2 |
| | | | 2. Elderly Patient Counseling and Care Planning | 0 | 0 | 2 | |
| | | | **Total** | 12 | 3 | 10 | **20** |
| **Total Contact Hours** | | | | **25** | | | |

**Course Outcomes for B.Sc. Geriatric Sciences MAJOR-Gerontology and Aging Biology**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Biological Processes of Aging | Explain the key biological processes involved in aging, including cellular aging, oxidative stress, DNA damage, and the role of telomeres and senescence in the aging process. |
| 2 | Analyze the Theories of Aging | Discuss the various theories of aging, such as the free radical theory, wear and tear theory, and programmed aging theory, and their implications for aging biology. |
| 3 | Explore the Genetics of Aging | Describe the role of genetics in aging, including the study of longevity genes, epigenetic changes, and the impact of genetic variation on aging and age-related diseases. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 4 | Understand the Role of Stem Cells in Aging | Investigate how stem cells contribute to tissue repair and regeneration, their role in aging, and the potential for stem cell therapy in age-related diseases. |
| 5 | Examine the Aging of Organ Systems | Explore how different organ systems (cardiovascular, musculoskeletal, neurological, endocrine, etc.) undergo age-related changes, contributing to the decline in physiological function. |
| 6 | Discuss the Impact of Hormonal Changes in Aging | Explain how aging affects hormonal regulation, including changes in growth hormone, estrogen, testosterone, insulin, and cortisol, and their influence on aging and health. |
| 7 | Explore Age-Related Diseases and Conditions | Discuss common age-related diseases such as Alzheimer's, osteoporosis, sarcopenia, cardiovascular diseases, and diabetes, and understand their biological underpinnings. |
| 8 | Investigate the Role of Inflammation in Aging | Explore how chronic low-grade inflammation (often referred to as "inflammaging") affects aging and contributes to the development of age-related diseases. |
| 9 | Understand the Role of Diet and Lifestyle in Aging | Discuss the impact of nutrition, exercise, and other lifestyle factors (e.g., sleep, stress management) on the biological aging process and longevity. |
| 10 | Examine the Physiological and Psychological Aspects of Aging | Explore how aging affects not only physical function but also cognitive and psychological aspects, including memory, mood, and mental health in older adults. |
| 11 | Discuss the Social Determinants of Aging | Investigate how factors like socio-economic status, education, environment, and healthcare access influence the aging process and the quality of life in older adults. |
| 12 | Apply Knowledge of Aging Biology in Geriatric Care | Integrate aging biology knowledge into the practice of geriatric care, focusing on promoting healthy aging, preventing age-related diseases, and improving the quality of life for older adults. |

**Course Outcomes for B.Sc. Geriatric Sciences MAJOR-Geriatric Medicine and Clinical Assessment**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Principles of Geriatric Medicine | Explain the key principles of geriatric medicine, including a holistic approach to elderly care, the multidisciplinary nature of geriatric teams, and the unique considerations in managing older adults. |
| 2 | Describe the Physiological Changes in Aging | Discuss the normal age-related physiological changes in various organ systems (e.g., cardiovascular, musculoskeletal, nervous, and renal systems) and how these affect clinical assessment and care. |
| 3 | Identify Common Geriatric Syndromes | Identify and describe common geriatric syndromes such as frailty, falls, incontinence, delirium, polypharmacy, and malnutrition, and understand their implications for clinical management. |
| 4 | Conduct a Comprehensive Geriatric Assessment | Learn the components of a comprehensive geriatric assessment (CGA), including the assessment of physical health, mental health, functional status, social support, and quality of life in older adults. |
| 5 | Assess Cognitive Function and Mental Health in Older Adults | Explore methods for assessing cognitive function in older adults, including the use of screening tools like the Mini-Mental State Examination (MMSE), and the role of psychological evaluations in diagnosing dementia and depression. |
| 6 | Evaluate Functional Status and Mobility in Geriatric Patients | Discuss the importance of evaluating functional status and mobility, including the use of performance measures (e.g., Timed Up and Go test), to assess the risk of disability and falls in elderly patients. |
| 7 | Understand the Role of Multimorbidity in Geriatric Medicine | Discuss the prevalence and impact of multimorbidity (the coexistence of multiple chronic conditions) in older adults and its influence on clinical assessment, treatment plans, and health outcomes. |
| 8 | Discuss the Challenges of Polypharmacy and Medication Management | Explore the challenges of polypharmacy in older adults, including medication interactions, side effects, and the need for medication reconciliation and deprescribing. |
| 9 | Apply Clinical Skills for Geriatric Pain Management | Understand the unique challenges in managing pain in older adults, including assessment tools, pharmacological and non- |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| | | pharmacological treatment options, and the management of complex pain syndromes. |
| 10 | Address End-of-Life Care and Advance Directives | Discuss the principles of end-of-life care, including advanced care planning, palliative care, hospice care, and the role of advance directives in geriatric medicine. |
| 11 | Incorporate Evidence-Based Practice in Geriatric Care | Learn how to apply evidence-based practices in the clinical management of older adults, with an emphasis on guidelines for common geriatric conditions, rehabilitation, and prevention. |
| 12 | Develop an Interdisciplinary Care Plan for Older Adults | Understand the importance of creating an individualized, interdisciplinary care plan for geriatric patients, involving healthcare providers from various specialties to address physical, emotional, and social needs. |

**Course Outcomes for B.Sc. Geriatric Sciences MAJOR-Common Geriatric Disorders and Management**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Prevalence and Impact of Geriatric Disorders | Explore the prevalence of common geriatric disorders and their impact on the quality of life, functional status, and overall health in older adults. |
| 2 | Identify and Manage Osteoporosis in Older Adults | Discuss the pathophysiology, risk factors, clinical assessment, and management strategies for osteoporosis, including pharmacologic treatments and lifestyle modifications. |
| 3 | Address the Challenges of Dementia and Cognitive Decline | Describe the different types of dementia (e.g., Alzheimer's, vascular dementia), their diagnostic criteria, progression, and management strategies, including pharmacological and non-pharmacological interventions. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 4 | Discuss Management of Depression in Older Adults | Explore the clinical presentation, risk factors, and treatment options for depression in older adults, including pharmacologic treatments, psychotherapy, and psychosocial interventions. |
| 5 | Manage Cardiovascular Diseases in the Elderly | Understand the common cardiovascular diseases in older adults (e.g., hypertension, heart failure, atrial fibrillation), their management, and the challenges of treatment in the elderly population. |
| 6 | Address Falls and Mobility Issues in Older Adults | Identify the causes and risk factors of falls in older adults, and discuss the assessment, prevention strategies, and management options, including balance training and home safety interventions. |
| 7 | Manage Diabetes and Metabolic Syndrome in Older Adults | Discuss the unique challenges in diagnosing and managing diabetes and metabolic syndrome in older adults, including individualized treatment goals, polypharmacy, and comorbidities. |
| 8 | Address Incontinence in the Elderly | Explore the different types of urinary incontinence in older adults, their causes, assessment, and management strategies, including pharmacologic treatments, lifestyle changes, and pelvic floor exercises. |
| 9 | Manage Sarcopenia and Frailty in Older Adults | Discuss the pathophysiology and clinical significance of sarcopenia and frailty, as well as their impact on mobility and independence, and explore management strategies including exercise, nutrition, and pharmacological interventions. |
| 10 | Understand the Management of Chronic Pain in Older Adults | Discuss the challenges of assessing and managing chronic pain in older adults, including pharmacologic options, non-pharmacologic therapies, and the management of pain associated with conditions like osteoarthritis and neuropathy. |
| 11 | Address End-of-Life Care and Palliative Management | Explore the principles of palliative care and end-of-life management, including symptom management, communication strategies, advanced care planning, and ethical considerations. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 12 | Integrate Multidisciplinary Care for Geriatric Disorders | Discuss the importance of a multidisciplinary approach to managing common geriatric disorders, including the roles of physicians, nurses, therapists, social workers, and other healthcare professionals in creating comprehensive care plans for older adults. |

**Course Outcomes for B.Sc. Geriatric Sciences MAJOR-Nutrition and Lifestyle Interventions in Aging**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Role of Nutrition in Healthy Aging | Discuss the importance of nutrition in aging, including the physiological changes that occur with age and how proper nutrition can prevent or manage age-related conditions. |
| 2 | Explore the Nutritional Needs of Older Adults | Examine the specific nutritional requirements of older adults, including protein, vitamins (e.g., vitamin D, B12), minerals (e.g., calcium), and the role of hydration in maintaining health. |
| 3 | Identify the Impact of Malnutrition in the Elderly | Discuss the causes and consequences of malnutrition in older adults, including physical, cognitive, and functional decline, and explore strategies for early identification and intervention. |
| 4 | Address Nutritional Management of Chronic Conditions | Explore how nutrition plays a role in managing chronic conditions common in older adults, such as diabetes, cardiovascular disease, hypertension, and osteoporosis, and the use of specific dietary modifications. |
| 5 | Discuss the Role of Supplements in Geriatric Nutrition | Explore the use of dietary supplements (e.g., calcium, vitamin D, omega-3 fatty acids) in older adults, considering evidence for efficacy, risks of overuse, and interactions with medications. |
| 6 | Promote Physical Activity and Exercise for Older Adults | Understand the importance of physical activity in aging, including the benefits of aerobic exercise, strength training, and flexibility exercises in improving mobility, bone health, and cognitive function. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 7 | Explore the Relationship Between Exercise and Cognitive Health | Discuss how regular physical activity can support cognitive health and reduce the risk of cognitive decline and dementia, emphasizing exercise strategies and guidelines for older adults. |
| 8 | Understand the Role of Sleep in Healthy Aging | Discuss the changes in sleep patterns that occur with age, the effects of poor sleep on physical and mental health, and strategies to improve sleep quality in older adults. |
| 9 | Implement Weight Management Strategies in Older Adults | Explore the challenges and strategies related to weight management in older adults, including the importance of maintaining a healthy weight to reduce the risk of chronic diseases and improve mobility. |
| 10 | Address Mental Health and Stress Management in Aging | Examine the impact of mental health and stress on aging, including strategies for managing stress, promoting mental well-being, and preventing depression and anxiety in older adults. |
| 11 | Discuss the Role of Social Engagement and Cognitive Stimulation | Explore the importance of social engagement, lifelong learning, and cognitive stimulation in preventing isolation, depression, and cognitive decline in older adults. |
| 12 | Design a Holistic Nutrition and Lifestyle Plan for Older Adults | Develop a comprehensive nutrition and lifestyle intervention plan for older adults, considering their unique needs, preferences, comorbidities, and goals for improving overall health and quality of life. |

**Course Outcomes for B.Sc. Geriatric Sciences MINOR-Psychosocial Aspects of Aging**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Psychological and Social Changes with Aging | Discuss the key psychological and social changes that occur with aging, including shifts in identity, roles, and relationships, and their impact on mental health and well-being. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 2 | Explore Theories of Aging and Psychological Development | Examine major theories of aging, such as Erikson's stages of psychosocial development, and how they explain psychological growth and adaptation in older adults. |
| 3 | Analyze the Impact of Retirement and Role Transitions | Explore the psychological effects of retirement, role changes (e.g., becoming a caregiver or grandparent), and how older adults adapt to shifts in daily routines, income, and social identity. |
| 4 | Discuss Social Isolation and Loneliness in Older Adults | Investigate the causes and consequences of social isolation and loneliness in aging, and explore strategies to mitigate these issues through social support, community engagement, and technology. |
| 5 | Examine the Impact of Bereavement and Loss in Aging | Discuss the emotional and psychological impact of bereavement in older adults, the grief process, and strategies for supporting individuals through the loss of a spouse, friends, or loved ones. |
| 6 | Understand the Role of Family and Caregiving in Aging | Explore the dynamic between older adults and their caregivers, including family roles, caregiver stress, and the importance of support systems in managing caregiving responsibilities. |
| 7 | Address Mental Health Issues in Older Adults | Explore common mental health challenges faced by older adults, including depression, anxiety, and cognitive decline, and the importance of early detection, intervention, and treatment options. |
| 8 | Discuss the Impact of Aging on Self-Esteem and Body Image | Examine how aging affects self-esteem and body image, the societal perceptions of aging, and how older adults cope with changes in appearance, abilities, and independence. |
| 9 | Explore Ageism and Its Psychological Effects | Investigate the impact of ageism on older adults, including stereotypes and discrimination, and how these can affect their self-perception, mental health, and social inclusion. |
| 10 | Analyze the Role of Spirituality and Religion in Aging | Explore the role of spirituality and religious practices in the lives of older adults, including how these can provide meaning, comfort, and resilience during the aging process. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 11 | Promote Psychological Resilience in Older Adults | Discuss strategies to promote psychological resilience in aging, including coping mechanisms, emotional regulation, and the development of positive aging attitudes. |
| 12 | Support Aging in Place and the Importance of Community | Examine the concept of "aging in place," including the importance of community resources, social networks, and environmental factors that contribute to successful aging and psychological well-being. |

**Course Outcomes for B.Sc. Geriatric Sciences MINOR-Technological Innovations in Elderly Care**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Role of Technology in Elderly Care | Discuss the growing role of technology in improving the quality of care, independence, and well-being of older adults, and its potential to address challenges such as mobility, cognitive decline, and healthcare access. |
| 2 | Explore Assistive Technologies for Aging Adults | Examine various assistive devices and technologies designed to enhance daily living for older adults, including mobility aids (e.g., walkers, wheelchairs), hearing aids, vision assistance tools, and smart home technologies. |
| 3 | Discuss Remote Monitoring and Telehealth Solutions | Explore the development and use of telehealth and remote monitoring technologies, including wearable devices, sensors, and telemedicine, to track vital signs, medication adherence, and chronic conditions in elderly patients. |
| 4 | Analyze the Impact of Smart Homes on Aging in Place | Investigate the role of smart home technologies (e.g., automated lighting, smart thermostats, fall detection sensors) in enabling older adults to live independently in their homes for longer, while ensuring safety and comfort. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 5 | Understand the Use of Artificial Intelligence (AI) in Elderly Care | Explore how AI and machine learning are being applied in elderly care, including personalized care plans, predictive analytics for fall risk, cognitive health monitoring, and virtual assistants. |
| 6 | Examine Robotics in Geriatric Care | Discuss the use of robotics in elderly care, such as robotic caregivers, exoskeletons, and robots designed for companionship, mobility assistance, and rehabilitation. |
| 7 | Explore Digital Health Solutions for Chronic Disease Management | Review digital tools for managing chronic conditions common in aging populations, such as diabetes, hypertension, and cardiovascular diseases, including mobile apps, wearables, and online platforms for self-monitoring. |
| 8 | Discuss Virtual Reality (VR) and Augmented Reality (AR) in Elderly Care | Investigate the application of VR and AR technologies for therapeutic purposes in elderly care, such as cognitive training, physical rehabilitation, and reducing symptoms of dementia or anxiety. |
| 9 | Understand the Role of Social Media and Communication Tools | Discuss how technology enables older adults to stay connected socially and emotionally through video calls, social media, and other communication platforms, promoting socialization and reducing isolation. |
| 10 | Address Privacy and Ethical Concerns in Elderly Care Technologies | Examine the ethical, privacy, and security issues related to the use of technology in elderly care, such as data protection, consent, and maintaining autonomy while using assistive technologies. |
| 11 | Review Mobile Health Apps for Mental Health and Well-being | Discuss the availability and effectiveness of mobile health apps designed to support mental health, emotional well-being, and cognitive function in older adults, including anxiety and depression management tools. |
| 12 | Implement Technological Innovations in Geriatric Care Settings | Develop strategies to integrate technological innovations into geriatric care settings, including home care, assisted living facilities, and hospitals, while considering patient preferences, training, and staff adaptation. |

**Course Outcomes for B.Sc. Geriatric Sciences MINOR-Geriatric Pharmacology**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Principles of Geriatric Pharmacology | Discuss the key principles of pharmacology as they apply to older adults, including changes in pharmacokinetics and pharmacodynamics due to aging, and how these influence drug therapy. |
| 2 | Explore Age-Related Changes in Drug Metabolism | Examine how aging affects drug absorption, distribution, metabolism, and excretion (ADME), and the implications for dosing, drug interactions, and side effects in older adults. |
| 3 | Discuss Polypharmacy and Its Risks in Older Adults | Understand the concept of polypharmacy, the risks it presents to older adults, including adverse drug reactions (ADRs), drug-drug interactions, and the challenges of medication adherence. |
| 4 | Analyze Common Medications in Geriatric Care | Explore commonly prescribed medications for older adults, including those used for chronic conditions such as hypertension, diabetes, arthritis, and dementia, and understand their benefits and potential side effects. |
| 5 | Discuss the Use of Psychotropic Medications in Older Adults | Review the indications, benefits, and risks of psychotropic medications (e.g., antidepressants, antipsychotics, anxiolytics) in the elderly, considering the special concerns regarding sedation, cognitive function, and delirium. |
| 6 | Address Pain Management and Analgesic Use in Geriatric Patients | Discuss the management of pain in older adults, focusing on the safe use of analgesics (e.g., opioids, NSAIDs, acetaminophen), as well as non-pharmacological interventions and the risks of polypharmacy and overdose. |
| 7 | Examine the Role of Anticholinergic Drugs in the Elderly | Explore the effects and risks of anticholinergic medications in the elderly, including their association with cognitive decline, delirium, and other adverse effects, and strategies for minimizing their use. |
| 8 | Understand the Pharmacology of Cardiovascular Drugs in Aging | Review the use of cardiovascular drugs (e.g., antihypertensives, diuretics, anticoagulants, statins) in older adults, focusing on age-related considerations, such as renal function and frailty. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 9 | Explore Diabetes Management and Pharmacological Interventions | Discuss the pharmacological management of diabetes in older adults, including insulin therapy, oral hypoglycemics, and the challenges of adjusting treatment based on comorbidities and polypharmacy. |
| 10 | Address Medication Management for Cognitive Disorders | Examine the pharmacologic treatments for cognitive disorders in older adults, such as Alzheimer's and other dementias, including cholinesterase inhibitors and NMDA antagonists, and their side effects and efficacy. |
| 11 | Discuss the Impact of Nutritional Supplements and Herbal Remedies | Investigate the use of nutritional supplements, vitamins, and herbal remedies in elderly care, including their benefits, risks, and potential interactions with prescription medications. |
| 12 | Apply Principles of Geriatric Pharmacology in Clinical Practice | Integrate knowledge of geriatric pharmacology into clinical practice by developing safe, individualized pharmacologic treatment plans, monitoring for adverse effects, and promoting medication adherence in older patients. |

**Course Outcomes for B.Sc. Geriatric Sciences MINOR-Geriatric Rehabilitation and Assistive Technologies**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Principles of Geriatric Rehabilitation | Discuss the principles of rehabilitation in older adults, emphasizing functional recovery, improving quality of life, and promoting independence through individualized rehabilitation plans. |
| 2 | Explore the Role of Physical Therapy in Aging | Examine the role of physical therapy in addressing mobility, balance, strength, and coordination issues in older adults, and its role in preventing falls and promoting functional independence. |
| 3 | Address the Role of Occupational Therapy in Geriatric Care | Discuss the role of occupational therapy in helping older adults maintain or regain their ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs). |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 4 | Understand the Importance of Speech and Language Therapy | Review the role of speech-language therapy in addressing communication disorders, swallowing difficulties, and cognitive impairments such as aphasia and dysphagia in the elderly. |
| 5 | Examine the Impact of Assistive Devices in Geriatric Rehabilitation | Explore common assistive devices used in rehabilitation, such as mobility aids (walkers, canes, wheelchairs), hearing aids, and vision aids, and their role in promoting independence and safety. |
| 6 | Discuss the Role of Technology in Geriatric Rehabilitation | Investigate how technology, including wearable devices, virtual reality (VR), and telemedicine, is being used to enhance rehabilitation, monitor progress, and provide remote support for elderly patients. |
| 7 | Explore the Use of Robotics in Geriatric Rehabilitation | Discuss the use of robotic devices for rehabilitation purposes, such as exoskeletons, robotic-assisted therapy, and robotic rehabilitation systems, and how they are being used to assist with mobility, strength, and recovery. |
| 8 | Analyze the Role of Cognitive Rehabilitation in Aging | Examine the importance of cognitive rehabilitation in addressing age-related cognitive decline and dementia, including therapies aimed at improving memory, attention, and executive function. |
| 9 | Discuss Pain Management Strategies in Geriatric Rehabilitation | Understand the approaches to pain management in geriatric rehabilitation, including pharmacological and non-pharmacological interventions, such as TENS (transcutaneous electrical nerve stimulation) and heat therapy. |
| 10 | Address the Role of Social Support in Rehabilitation | Explore the impact of social support networks, including family, caregivers, and community resources, in the rehabilitation process and the mental and emotional well-being of older adults. |
| 11 | Promote Falls Prevention through Rehabilitation and Assistive Technology | Discuss strategies for falls prevention in older adults, including balance training, strength exercises, environmental modifications, and the use of assistive devices such as fall detection systems. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 12 | Design a Comprehensive Rehabilitation Plan for Older Adults | Integrate knowledge of rehabilitation techniques and assistive technologies to design a holistic rehabilitation plan for elderly individuals, considering their physical, cognitive, and emotional needs. |

**Course Outcomes for B.Sc. Geriatric Sciences MINOR-Research Methodology & Biostatistics**

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 1 | Understand the Basics of Research Methodology | Introduce the fundamentals of research methodology, including the research process, types of research (descriptive, analytical, experimental), and the importance of clear research objectives. |
| 2 | Explore the Different Types of Research Designs | Discuss various research designs used in healthcare, such as cross-sectional, cohort, case-control, randomized controlled trials (RCTs), and qualitative studies, and their applications in geriatric and aging research. |
| 3 | Develop Research Questions and Hypotheses | Explain how to formulate clear, researchable questions and hypotheses, and the role they play in guiding the research process, including operational definitions and study aims. |
| 4 | Understand Sampling Methods and Study Populations | Discuss the different types of sampling methods (e.g., random, stratified, purposive) and how to select appropriate study populations, including considerations for inclusion and exclusion criteria. |

| Sr. No. | Course Outcome | Description |
|---|---|---|
| 5 | Explore Data Collection Techniques | Review various data collection methods, such as surveys, interviews, questionnaires, clinical assessments, and observational methods, and how to choose the most appropriate method for specific research aims. |
| 6 | Discuss Validity and Reliability in Research | Explain the concepts of validity (internal and external) and reliability in research, and how to ensure that data collection instruments and study designs produce accurate and consistent results. |
| 7 | Introduction to Biostatistics | Introduce basic biostatistics concepts, including descriptive statistics, probability theory, and statistical distributions, and their application in analyzing data from health-related studies. |
| 8 | Analyze Data Using Descriptive Statistics | Learn to calculate and interpret basic descriptive statistics, such as mean, median, mode, range, variance, and standard deviation, and how to use these metrics to summarize and describe research data. |
| 9 | Understand Inferential Statistics and Hypothesis Testing | Introduce inferential statistics, including hypothesis testing, p-values, confidence intervals, t-tests, chi-square tests, and analysis of variance (ANOVA), and how to apply these techniques to draw conclusions from research data. |
| 10 | Explore Regression Analysis in Biostatistics | Discuss the basics of regression analysis (linear and logistic) and its application in understanding relationships between variables and predicting outcomes in health research. |
| 11 | Understand Ethical Considerations in Research | Examine the ethical principles involved in conducting research, including informed consent, confidentiality, risk-benefit analysis, and the protection of vulnerable populations, particularly in geriatric studies. |
| 12 | Interpret Research Results and Report Findings | Learn how to analyze and interpret research findings, including the importance of statistical significance and clinical relevance, and how to report results in research papers, presentations, and scientific publications. |

**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 geriatric care |
| **Practical Performance & Clinical Evaluation** | **5%** (Part of CIA) | Skill-based assessments in labs/hospitals |
| **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

**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:**

- Geriatric Physiology & Aging – 40%
- Clinical Geriatric Care & Pharmacology – 30%
- Research & Case Studies – 20%
- Public Health & Geriatric Rehabilitation – 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 & Comprehensive Geriatric Assessment | 30 |
| OSCE (Objective Structured Clinical Examination) – Skill Demonstration | 25 |
| Functional, Cognitive & Psychosocial Assessment of Elderly Patients | 20 |
| Lab-Based Examination (Geriatric Health Screening, Medication Review, Nutritional & Mobility Assessment) | 15 |
| Record Work (Logbook & Assignments) | 10 |
| **Total** | **100** |

## OSCE (Skill-based Assessment) includes stations on:

- Blood Pressure & Cardiovascular Monitoring in Elderly
- Gait & Mobility Assessment (Timed Up & Go Test, Fall Risk Evaluation)
- Cognitive Screening (MMSE, MoCA) & Mental Health Assessment
- Medication Management & Polypharmacy Counseling

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

**Recommended Books & E-Resources**

**Textbooks**

- "Oxford Textbook of Geriatric Medicine" – J. Grimley Evans
- "Geriatrics: A Case-Based Approach" – Andrea Bozoki
- "Clinical Geriatrics" – Howard M. Fillit
- "Aging & Mental Health" – Daniel L. Segal

**E-Resources & Journals**

- Journal of Aging Studies
- World Health Organization (WHO) Reports on Aging
- International Journal of Geriatric Psychiatry

**Conclusion**

The M.Sc. in Geriatric Sciences prepares graduates to meet the healthcare needs of an aging population through clinical expertise, research, and policy development. With an increasing demand for geriatric professionals, this program offers promising career opportunities in healthcare, elder care, and research.