



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF BASIC MEDICAL SCIENCES

MASTER IN HOSPITAL ADMINISTRATION
(MHA)

SYLLABUS

YEAR/ SEMESTER: II/III

INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH
DEPARTMENT OF BASIC MEDICAL SCIENCES
STUDY & EVALUATION SCHEME
MASTER IN HOSPITAL ADMINISTRATION (MHA)
(W.e.f. July 2023)

II-Year

III-Semester

| S.N. | Course code | Course Title | Type of Paper | Period Per hr/week/sem | | | Evaluation Scheme | | | | Sub. Total | Credit | Total Credits |
|--------------|-------------|--|---------------|------------------------|---|----|-------------------|-----|-------|-----|------------|--------|---------------|
| | | | | L | T | P | CT | TA | Total | ESE | | | |
| | | | | THEORIES | | | | | | | | | |
| 1 | HA501 | Hospitals Operations Management | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 2 | HA502 | Marketing & Strategic Management in Hospital | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 3 | HA503 | Hospital Infection Control & Waste Management | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 4 | HA504 | Healthcare Laws, Ethics and Counseling Skills | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 5 | HA505 | Epidemiology, Biostatistics & Research Methods | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 6 | HA506 | Seminar/JC/GD/Case Studies | Core | 0 | 0 | 4 | 25 | 25 | 50 | -- | 50 | 0:0:2 | 2 |
| 7 | HA507 | Hospital/Department Posting | Core | 0 | 0 | 10 | 25 | 25 | 50 | -- | 50 | 0:0:5 | 5 |
| Total | | | | 10 | 5 | 14 | 250 | 150 | 400 | 200 | 600 | 22 | 22 |

L:
Lecture

TA: Teacher Assessment

ESE: End Semester Examination

Sessional Total: Class Test + Teacher Assessment

Subject Total: Sessional Total + End Semester Examination (ESE)



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|--|---|----------------------------|--|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA501 | Title of the Course | Hospitals Operations Management | L | T | P | C |
| Year | II | Semester | III | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | To familiarize the student with hospital operational activities. The student shall understand the process of purchase and inventory management in a health care establishment, apart from productivity aspects. | | | | | | |

| Course Outcomes | |
|------------------------|--|
| CO1 | To explain the meaning and nature of Front Office-Admission. Students should also relate Front Office-Admission to the field of Management. |
| CO2 | Students should be able to Understand about the Clinical Services used in the hospital and its management. |
| CO3 | They should understand the concepts supporting services towards employee productivity. |
| CO4 | To acquire knowledge about Facility Location and Layout of the hospital. |
| CO5 | To understand the process of controlling and types of Purchasing Strategy Process. Also, they should know about the ways of effective Purchasing Strategy Process in management. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|------------------------------|---|---------------------|------------------|
| 1 | FRONT OFFICE-ADMISSION | Billing – Medical Records – Ambulatory Care- Death in Hospital – Brought-in Dead. Maintenance and Repairs Bio Medical Equipment | 07 | CO1 |
| 2 | CLINICAL SERVICES | Clinical Departments – Out patient department (OPD) – Introduction – Location – Types of patients in OPD – Facilities – Flow pattern of patients – Training and Co-ordination. Radiology – Location – Layout – X-Ray rooms – Types of X-Ray machines – Staff - USG – CT – MRI – ECG. | 07 | CO2 |
| 3 | SUPPORTING SERVICES | House Keeping –Linen and Laundry, - Food Services -Central Sterile Supply Department (CSSD) | 08 | CO3 |
| 4 | FACILITY LOCATION AND LAYOUT | importance of location, factors, general steps in location and selection decision process, types of lay outs – product, process, service facility layout; Introduction, setting work standards, techniques of work measurement, time and motion study, standard time, PMT, work sampling, calibration of hospital equipment’s. Productivity measures, value addition, capacity utilization, productivity – capital operations, HR, incentives calculation, applications in hospital | 07 | CO4 |
| 5 | PURCHASING STRATEGY PROCESS | Organizing the purchasing function – financial aspects of purchasing – tactical and operational applications in purchasing management Inventory Management: valuation and accounting for inventory – physical location and control of inventory – planning and replenishment concepts – protecting inventory; Value Management, Value engineering, value analysis. | 06 | CO5 |

Reference Books:

1. Madhuri Sharma, Essentials for hospital support services and physical infrastructure, Jaypee Brothers Publications.
2. Sakharkar BM, Principles of hospitals administration and planning, Jaypee Brothers publications.
3. Francis CM, Mario C de Souza: Hospital Administration, New Delhi, 2000.
4. Reaction of patients towards evening OP services in Delhi Hospitals, Hospital Administration, 14 (13), 1977.
5. Chakravarthy S: Planning of Surgical Suites, National workshop on hospital planning and Design, AIIMS, New Delhi, 1987.
6. Prabhu KM, Sood SK: Hospital Laboratory Services Organization and Management, Journal of Academy of Hospital Administration, 2(@) 1990.
7. S.L. GOEL, Healthcare Management and Administration, Deep & Deep Publications Pvt. Ltd., New Delhi.
8. Srinivasan, A.V. (ed), Managing a Modern Hospital, Chapters 12, Response Books, New Delhi,2000.
9. Schroedev, Roger G., Operations Management – Decision Making in Operations Function, McGrawHill, New Delhi.
10. Buffa, Elwood S. and Sarin, Rakesh K., Modern Production/Operations Management, John Wiley & Sons, Singapore, 1987

e-Learning Source:

1. <https://www.youtube.com/watch?v=-OhmAGm8XmE>
2. <https://www.youtube.com/watch?v=FpQEwbAV3Qw>
3. (184) Webinar on Strategic Procurement || Speaker: Manoj Kulkarni Yermalkar - YouTube

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|---------------------------------|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA501 | Hospitals Operations Management | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | | √ | √ | | | √ | √ | |



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|--|---|----------------------------|---|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA502 | Title of the Course | MARKETING & STRATEGIC MANAGEMENT IN HOSPITAL | L | T | P | C |
| Year | II | Semester | III | 2 | 1 | 0 | 3 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | The objective of the course is to equip the students from the various economic issues that they are expected to face as managers at the firm level. The course also aims to make the students aware of the working of the markets, the determination of prices and the techniques of decision making that they can adopt to ensure that sound decisions are made. | | | | | | |

| Course Outcomes | |
|------------------------|---|
| CO1 | Appreciate the concepts of marketing management |
| CO2 | Enlist functional areas of marketing management and its application. |
| CO3 | Appreciate the importance of marketing process for different types of products and services |
| CO4 | Apply tools and techniques to identify problems and recommend solutions pertaining to marketing management. |
| CO5 | Describe Business Development process and Strategic management |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|-----------------------------|--|---------------------|------------------|
| 1 | Marketing Management | Basic concept of Marketing Management – Consumer Behaviour, Marketing, Pricing of various services, Marketing strategy, evaluation and control, Promotion of Business in Hospital, Service Marketing – Patient care and communication. Hospital Image Building, Marketing promotional activities, Corporate marketing, Marketing for TPA and Cash Patients, Social aspect of marketing. | 8 | CO1 |
| 2 | Pricing Management | Basic of Pricing, Types of Pricing, Pricing Technique, Promotion tools of Healthcare Marketing, Advertisement and Branding, Sales Promotion, Marketing Myopia | 6 | CO2 |
| 3 | Business Development | Concept and Scope of Business Development, components, The evolutionary pattern of business development, The pitfalls of business development, The diversity of current business development practices, Succeeding with business development, From business development to business development management (BDM). | 6 | CO3 |
| 4 | | Integrating business development - Connecting strategy and implementation, The rules of engagement, Healthcare business strategy, Leadership skills & Business Development. Entrepreneurship skill. | 6 | CO4 |
| 5 | Strategic Management | Process, situation analysis, stakeholder analysis, strategy formulation & implementation, Forecasting methods, Monitoring techniques, evaluation procedures and tools | 6 | CO5 |

| | |
|---------------------------|--|
| Reference Books: | |
| 1. | Service Marketing Management - Kotler & Keller |
| 2. | Advertising Management - S. Krishnan |
| 3. | Journal of Hospital Administration (JAHA) |
| 4. | Journal of Hospital Marketing & Public Relations |
| e-Learning Source: | |
| 1. | Journal of Hospital Administration (JAHA) |
| 2. | Journal of Hospital Marketing & Public Relations |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 1 | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 1 |
| CO4 | 2 | 2 | 1 | 3 | 1 | 2 | 2 | 1 | 1 |
| CO5 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 4 |

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|--|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA502 | Marketing & Strategic Management in Hospital | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 8, 9 |
| | | √ | √ | √ | | √ | | | |



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|--|---|----------------------------|--|----------|----------|----------|----------|
| Effective from Session: 2024-25 | | | | | | | |
| Course Code | HA503 | Title of the Course | HOSPITAL INFECTION CONTROL & WASTE MANAGEMENT | L | T | P | C |
| Year | II | Semester | III | 2 | 1 | 0 | 3 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | The objective of the course is to understand about the hospital related infection . | | | | | | |

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|---|---|
| Course Outcomes: After the successful course completion, learners will develop following attributes: | |
| CO1 | To understand Hospital Acquired Infection. |
| CO2 | To understand Infection Chain. |
| CO3 | Enlist the best practices in the field of hospital infection prevention and control |
| CO4 | Appreciate the significance of Biomedical Waste management and its safe disposal. |
| CO5 | Apply universal standards and precautions in hospital settings. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|---|---------------------|------------------|
| 1 | Hospital Acquired Infection | Introduction to Healthcare acquired Infections, Epidemiology of Healthcare Associated Infections. Infection Control Team in Healthcare setting, Universal safety measure to prevent HAI. | 6 | CO1 |
| 2 | Infection Chain | Definition of Hospital Acquired Infection, Infectious Agents, Reservoir, Portal of Exits, Mode of Transmission, Portals of Entry, Susceptible Hosts ,Role of Hospital Ambience in transmission of infection. | 9 | CO2 |
| 3 | Hospital Infection Control Committee | Hospital Infection Control Committee, Structure of Hospital infection Control Committee, Role and Responsibilities of HICC, Role of infection Control Nurse. | 6 | CO3 |
| 4 | Biomedical Waste Management | Introduction, types & composition of biomedical wastes - (Liquid BMW, Radioactive waste, Metals, Chemicals, Drug waste), health hazards & risks, Systematic BMW disposal- Segregation, collection, transportation, disposal, Management & methods of disinfection, Modern technology for handling BMW, Monitoring & controlling of cross infection. | 9 | CO4 |
| 5 | Hospital Infection Control Program | Hospital Infection Control Program- Preventive Measure , Surveillance Continuing Application, Bundle Approach(Bundle for precaution for catheter associated infections, Surgical site infections, Ventilator associated Pneumonia, Bloodstream Infections). | 9 | CO5 |

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|---------------------------|--|
| Reference Books: | |
| 1. | Essentials of Hospital Infection Control ,S Apruba Sastry, R Deepashree Jaypee Brothers Medical Publishers |
| 2. | Hospital Infection Prevention Principles & Practices [06/08, 5:15 pm] gc: Chand Wattal, Nancy Khadori |
| 3. | Khan S, Syed AT, Ahmad R, Rather TA, Ajaz M, Jan FA (2010). Radioactive waste management in a hospital. International Journal of Health Sciences, 4(1): 43-51. |
| 4. | BMW management by J Kishore, Century Publications |
| 5. | Sonu Goel, Anil Kumar Gupta and Amarjeet Singh (2014). (Editors). Hospital Administration – A Problem-Solving Approach. New Delhi: Elsevier. |
| e-Learning Source: | |
| 1. | https://youtu.be/aZFT72kbFKo?si=2362vtwG5HxKti |
| 2. | https://youtu.be/OAX5WJB3LDE?si=Ys8oKE86LSXXVsRT |
| 3. | https://youtu.be/_PLRqUTgr1c?si=9U_59YkT6tewjPIG |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

| Course Code | COURSE TITLE | Attributes | | | | | | | SDGs No. |
|--------------------|--|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA503 | HOSPITAL INFECTION CONTROL & WASTE MANAGEMENT | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4, 17 |
| | | √ | √ | √ | | | | | |



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|--|--|----------------------------|---|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA504 | Title of the Course | HEALTH CARE LAWS, ETHICS & COUNSELING SKILLS | L | T | P | C |
| Year | II | Semester | III | 2 | 1 | 0 | 3 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | The Course aims at familiarizing the students with various aspects of Health Care Laws, Ethics & Counseling Skills. The basic objective is to help the students to acquire and develop decision-making skills in relation to Health Care Laws, Ethics & Counseling Skills. | | | | | | |

| Course Outcomes | |
|------------------------|--|
| CO1 | To provide the basic understanding of Establishment Act. |
| CO2 | To making the students able to understand about the Hospital Services and Law. |
| CO3 | Making the students about the Hospitals and Labour Enactments. |
| CO4 | To provide the basic understanding of Legal frame work. |
| CO5 | To provide the optimal knowledge of Counseling skills. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|--|--|---------------------|------------------|
| 1 | ESTABLISHMENT ACT | Uttar Pradesh Private Medical Care Establishment Act; Formation of a Health care Organization under Partnerships and Corporate basis (private and public); Public Private Partnerships in health care; National Medical Council; Physician Patient relationship; Duties towards patients by medical and Para-medical staff; Medical ethics & Oaths; Code of conduct. | 6 | CO1 |
| 2 | HOSPITAL SERVICES AND LAW | Contractual obligations in Hospital Services; Requisites of a valid contract; Contractual liability and damages; Criminal liability and defenses available to hospitals and medical staff; tortuous and vicarious liability; Legal remedies available to patients, Hospital as a bailee; CP Act, RTI. | 6 | CO2 |
| 3 | HOSPITALS AND LABOUR ENACTMENTS | Hospital as an Industry; Unrest in Hospitals; Dispute Settlement Mechanisms; Role of Trade Unions; Unfair Labour Practices and Victimization; Disciplinary Actions – Requisitions of a valid disciplinary enquiry; Service Conditions; Retiral benefits; Social Security and Insurance. | 6 | CO3 |
| 4 | LEGAL FRAME WORK: | Patient right's and responsibility; Medical malpractice; Medico legal aspects of: impotence, sterility, sterilization and artificial insemination; Medico legal aspects of psychiatric & mental health; Toxicology - laws related to toxicology; Giving evidence in police investigation; Organ transplantation; Euthanasia (mercy killing); Diagnosis, prescriptions and administration of drugs; Anesthesia and Surgery. | 6 | CO4 |
| 5 | COUNSELING SKILLS | Introduction, growth of Counseling Services; Approaches to counseling; Process of Counseling; Attitudes of Counselors; Skill of Counseling; Problems in Counseling; Assessing and diagnosing clients' problems; Selecting counselling strategies & interventions; Changing behavior through counseling; Application of Counseling to Hospital Situations with a Focus on Performance Improvement. | 6 | CO5 |

Reference Books:

- S.L. Goel, Healthcare Management and Administration, Deep & Deep Publications Pvt. Ltd. New Delhi, 2010
- Harris, D. (2014). Contemporary Issues in Healthcare Law and Ethics. Chicago: Health Administration Press
- Kapoor, N. D. (1983). Elements of mercantile law: Including company law and industrial law. New Delhi: Sultan Chand & Sons.
- Kavita Singh, Counseling skills for Managers' PHI Publishing House.
- S.L. Goel, Healthcare Management and Administration, Deep & Deep Publications Pvt. Ltd. New Delhi, 2010

e-Learning Source:

- https://onlinecourses.nptel.ac.in/noc20_mg15/preview
- <https://in.coursera.org/specializations/human-resource-management>

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| CO3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 1 | 2 |
| CO4 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |

**1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs**

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|---|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA504 | HEALTH CARE LAWS, ETHICS & COUNSELING SKILLS | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4, 8 |
| | | √ | √ | √ | | | √ | √ | |



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|--|--|----------------------------|---|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA505 | Title of the Course | EPIDEMIOLOGY, BIostatISTICS & RESEARCH METHODS | L | T | P | C |
| Year | II | Semester | III | 2 | 1 | 0 | 3 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | At the end of this course, the student will able to Define epidemiology and appreciate its importance in hospital settings, Measure disease burden in the hospital settings using epidemiological methods, Design appropriate epidemiological study in a given scenario, Apply basic principles and methods of epidemiology in analyzing hospital data, Appreciate key bio statistical concepts and reasoning, Apply appropriate statistical methods for collection, compilation, analysis, interpretation and reporting of hospital data, Use statistical software for data entry, data processing and data analysis | | | | | | |

| Course Outcomes | |
|------------------------|--|
| CO1 | To understand the general epidemiological review and also learn about the disease epidemiology.. |
| CO2 | To understand the Epidemiologic Methods & Approaches and its use in management. |
| CO3 | To understand the Basic of Research and its implementation in hospital management. |
| CO4 | To understand the Basic of Biostatistics and its implementation in hospital management. |
| CO5 | To understand the Application Of Research Methods In Hospital Settings |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|--|---------------------|------------------|
| 1 | GENERAL EPIDEMIOLOGY | <ul style="list-style-type: none"> Definition, objective & scope of epidemiology, History and Evolution of epidemiology, achievements in epidemiology, Epidemiological Triangle, Distribution and determinants of disease; Disease transmission dynamics, Measurements in Epidemiology (morbidity, mortality, disability) - Incidence and prevalence, Usage of rates, ratios and proportions, quality of life; Concept of risk - absolute risk, relative risk, odds ratio, attributable risk, population attributable risk Association and causal relationship, Bias, Confounder & Interaction; Validity & reliability | 6 | CO1 |
| 2 | EPIDEMIOLOGIC METHODS & APPROACHES | <ul style="list-style-type: none"> Epidemiology and Clinical Practice, Epidemiological approach (asking questions and making comparisons) Quantitative (Observational, analytical & experimental studies) & Qualitative methods; Screening, Surveillance & Evaluation of health services and Public Policy; Sources & use of hospital statistics Use of epidemiological approaches & methods in evaluating functioning & services of hospital. Ethical and Professional Issues in Epidemiology | 6 | CO2 |
| 3 | BASIC OF RESEARCH | <ul style="list-style-type: none"> Meaning of Statistics, Statistical methodology, Branches of Statistics-Bio-Statistics, Vital Statistics, Health Statistics, Application of Statistical Methodologies in Healthcare Management Basic Concepts in Biostatistics: Data - its presentation & measurement Data: Definition and Types of data, Different scales of data measurement, Different methods of data collection, Merits and demerits of data collection methods under different situations, Classification of morbidity, mortality and socio-economic data <ul style="list-style-type: none"> Presentation of Data: Tabulation of data, Graphical presentation of data (Need and uses, Types of diagrams, bars, pie chart, line diagram, histogram, frequency polygon, frequency curve, Ogives) Measuring variation/dispersion of data: Mean, Median and Mode for raw data, Merits and Demerits, Calculation of Measures of Central tendency-ungrouped and grouped data (Calculation and interpretation of Range, Percentiles, Quartiles, Standard deviation and Co-efficient of variation- both ungrouped and grouped data) Probability: Concept of probability, Probability distributions and their applications in public health management, Normal distribution, Binomial distribution, Poisson distribution, Standard error of mean, difference of means, proportion and difference to two proportions | 6 | CO3 |
| 4 | BASIC BIOSTATISTIC | <ul style="list-style-type: none"> Sample and sampling techniques: Types of surveys, their role in public health. management, Planning of surveys, Concept of sampling, Use of random number tables for selection of samples, Different Sampling designs, Calculation of sample size for field surveys Testing of hypothesis: Concept of Sampling variation, Tests of significance Z-test, t-tests, Chi square test and Important Non-parametric tests, Pearsonian Correlation and Regression as prediction techniques, Introduction to Multivariate Correlation and Regression, Logistic Regression, Odds ratio and their applications in Public Health, Life table technique and Survival analysis, Introduction to Planning of Research studies Introduction to Statistical Software <ul style="list-style-type: none"> Data entry into software (Excel, Epi-Data, SPSS, Epi-Info) Data Analysis using software SPSS, R | 6 | CO4 |

| | | | | |
|---|---|--|---|-----|
| 5 | APPLICATION OF RESEARCH METHODS IN HOSPITAL SETTINGS | <ul style="list-style-type: none"> • Various Research methods, Research communication, Ethical & professional issues in Research • Marketing research in health care settings • Operations Research in relation to hospital management: OR techniques and its applications in hospital, Linear Programming, Decision tree Analysis, Queuing theory, PERT, CPM, Assignment Model, Management by objective & by result • Clinical Trials – stages of clinical trial, role of hospital in clinical trial & ethical issues | 6 | CO5 |
|---|---|--|---|-----|

Reference Books:

1. Leon Gordis (5th Edition, 2014) , Epidemiology, Saunders (Elsevier Inc) Publication
2. Mahajan B.K: Methods of biostatistics for Medical Students and Research Workers, 8th Edition, Revised and edited by Arun Bhadra Khanal, The Health Science, Publisher, New Delhi
3. Park's Textbook of Preventive and Social Medicine, 23rd Edition, (2017). K.Park.
4. Hill A.B : Principles of medical statistics, Oxford University press, New York
5. Textbook of Modern Epidemiology by Rothman

e-Learning Source:

1. Indian Journal of Public Health
2. Indian Journal of Community Medicine
3. International Journal of Epidemiology

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|--|-----|-----|-----|-----|-----|------|------|------|------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |

**2- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs**

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|-------------|--|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| HA505 | EPIDEMIOLOGY, BIOSTATISTICS & RESEARCH METHODS | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | √ | √ | √ | | | | | |



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|--|---|----------------------------|------------------------------------|----------|----------|----------|----------|
| Effective from Session: 2015-16 | | | | | | | |
| Course Code | HA506 | Title of the Course | Seminar /JC/GD/Case Studies | L | T | P | C |
| Year | II | Semester | III | 0 | 4 | 0 | 2 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | This course will serve as a platform for students to integrate various components of patient management and debate contentious issues in the efficacy of Physiotherapy techniques used in musculoskeletal, neurological, cardiopulmonary, & Sports rehabilitation as well as enhance presentation skills. | | | | | | |

| Course Outcomes | |
|------------------------|---|
| CO1 | The students will understand and interpret latest advancements through different technical papers, reports, Journals, Data sheets, books etc |
| CO2 | The students will inculcate the skills for literature survey and will learn to manage resources effectively. |
| CO3 | The students will be able to summarize the recent research and technologies in the form of review and will be able to deliver power point presentations on an assigned topic. |
| CO4 | The students will be able to communicate his/her ideas with his peers as audience, which will enhance both oral and written communication skills. |
| CO5 | The students will be able to create interest to pursue lifelong learning. |

SEMINAR PRESENTATION ASSESSMENTN FORM

| | | | |
|---------------------------|--|----------------------|--|
| Name of Student: | | Session: | |
| Enrollment Number: | | Date: | |
| Name of Subject: | | Subject code: | |
| Topics: | | | |

| Criteria | Sub-Criteria | Max. Marks | Marks Obtained |
|---|--|--------------------|-----------------------|
| Introduction (Max marks-03) | Use appropriate background information | 01 | |
| | Has clear statement of purpose | 01 | |
| | Shows a logical sequence | 01 | |
| Factual Content (Max marks- 15) | Includes accurate information | 03 | |
| | Shows up-to-date content | 02 | |
| | Presents relevant content | 02 | |
| | Shows in-depth and sufficient details | 02 | |
| | Addresses all important issues | 02 | |
| | Is selective | 02 | |
| | Use of proper English Grammar in the text | 02 | |
| Presentation Quality (Max marks-02) | Has a good design of presentation (appropriate font, type, size, color, matter per slide etc.) | 01 | |
| | Has a clear verbal expression and eye contact with audience | 01 | |
| Response to questions (Max marks-03) | Answers question(s) correctly | 01 | |
| | Has the ability to think on the spot | 01 | |
| | Shows an ability to defend content of presentation | 01 | |
| Time Management (Max. mark-02) | Completes the presentation within allocated time | 02 | |
| | | Total Marks | 25 |

Note: In case of Oral Presentation, each student will be assessed in a 20 minutes time (15 min for presentation & 5 min for discussion) out of 50 marks.

Comments/Suggestions:

(Name and signature of Incharge)

(Incharge, Hospital Management)

EVALUATION OF SEMINAR ON CLINICAL ISSUES PRESENTATION

MHA Students has to prepare minimum 2 long case and 2 short cases during their seminar presentation during due course of time. The evaluation for internal seminar examination of 50 marks will be distributed:

Cases during clinical posting=**25 marks**.

Viva voce =**20 marks**

Attendance=**5 marks**

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
| CO1 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 1 | - | - | 3 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 2 | 2 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 3 | 2 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 2 | 3 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 3 | 2 | 3 | 3 | 2 |

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|-------------|-----------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------|
| | | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | |
| HA506 | Seminar /JC/GD/Case Studies | √ | √ | √ | | | √ | √ | 3,4,9, 17 |



Integral University, Lucknow

| Effective from Session: 2023-24 | | | | | | | | | | |
|---------------------------------|-------|---------------------|-------------------------------|--|--|--|---|---|----|---|
| Course Code | HA507 | Title of the Course | Hospital/Departmental Posting | | | | L | T | P | C |
| Year | I | Semester | III | | | | 0 | 0 | 12 | 3 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | | | | |
| Course Objectives | | | | | | | | | | |

| Course Outcomes | |
|-----------------|---|
| CO1 | To provide the basic understanding of Introduction: Patient Rights. |
| CO2 | To making the students able to understand about the Policies and Procedures of the Hospitals |
| CO3 | Making the students about the Hospital Construction |
| CO4 | The objective of this unit is to make the students able to understand about the Concepts and Issues Related to Healthcare Technology |
| CO5 | To provide the optimal knowledge of Planning Process For Introduction of Technology in Healthcare |

HOSPITAL POTING ASSESSMENTN FORM

| | | | |
|--------------------------|--|----------------------|--|
| Name of Student: | | Session: | |
| Enrolment Number: | | Date: | |
| Name of Subject: | | Subject code: | |
| Topics: | | | |

| S. No. | Point to be Considered | Max. Marks | Marks Obtained |
|--------|--|------------|----------------|
| 1. | Punctuality | 3 | |
| 2. | Interaction with colleagues and supporting staff | 3 | |
| 3. | Maintenance of case records | 3 | |
| 4. | Presentation of case records during rounds | 3 | |
| 5. | Investigation work up in Hospital | 3 | |
| 6. | Manners to staffs during collection of Data | 3 | |
| 7. | Rapport with patients | 3 | |
| 8. | Discipline | 2 | |
| 9. | Overall quality of clinical work | 2 | |
| | TOTAL SCORE | 25 | |

(Name and signature of Incharge)

(Incharge, Hospital Management)

GUIDELINES FOR HOSPITAL TRAINING PROGRAM

The students of Post Graduate MHA program must spend above mentioned allotted time period in the hospital based clinical training for specified clinical experiences to meet the objectives of the training program. This period of practical and theoretical experience will enable the students to acquire competency and experience to perform as an independent practice and will enable to adjust to the real practical life in different units in the hospital settings.

By the successful completion of this clinical training period, the student is expected to fulfil the objectives of the program and will be examination as given below:

| S.No. | Program Name | Year/Semester | Practical on Case | Voice/Viva | Attendance |
|-------|--------------|-------------------------|--|------------|------------|
| 1. | MHA | Ist Year/ Ist Semester | 10 Marks (1 Long Case and 2 Short Case) | 10 Marks | 5 Marks |
| 2. | | Ist Year/ IInd Semester | | | |
| 3. | | IInd Year/ 3rd Semester | | | |
| 4. | | IInd Year/ 4th Semester | | | |

Recommendation:

Since the entry qualification for this master's degree program is graduation in any discipline exposure to and understanding of the internal working of a hospital is essential for every student to appreciate and assimilate the learning in the Masters programme. The subject is designed to facilitate this learning-objective and is based on the principle of "learning by observation". This subject will also help to learn "working in teams".

EVALUATION OF CLINICAL TRAINING

MHA- Students has to prepare 1 long case and 2 short cases during their clinical posting. The evaluation for internal clinical examination of 50 marks will be distributed:

Cases during clinical posting=**25 marks**.

Viva voce =**20 marks**

Attendance=**5 marks**

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|--|
| PO-PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | |
| CO1 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 1 | - | - | 3 | 2 | 3 | 3 | 2 | |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 2 | 2 | 3 | 2 | 3 | |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 3 | 2 | 2 | 2 | 3 | |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 2 | 3 | 2 | 2 | 3 | |

| | | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 3 | - | - | 3 | 2 | 3 | 3 | 2 |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|--------------------------------------|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA507 | Hospital/Departmental Posting | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | √ | √ | √ | √ | | √ | √ | |

INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH
DEPARTMENT OF BASIC MEDICAL SCIENCES
STUDY & EVALUATION SCHEME
MASTER IN HOSPITAL ADMINISTRATION (MHA)
(W.e.f. July 2023)

II-Year

IV-Semester

| S.N. | Course code | Course Title | Type of Paper | Period Per hr/week/sem | | | Evaluation Scheme | | | | Sub. Total | Credit | Total Credits |
|--------------|-------------|--|---------------|------------------------|---|----|-------------------|-----|-------|-----|------------|--------|---------------|
| | | | | L | T | P | CT | TA | Total | ESE | | | |
| | | | | THEORIES | | | | | | | | | |
| 1 | HA508 | Managerial Skill Development for Healthcare Professional | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 2 | HA509 | Healthcare Insurance | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 3 | HA510 | Medico legal Issues in Hospital | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 4 | HA511 | Enterprise Resource Planning for Hospitals | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 5 | HA512 | Hospital Hazards and Waste Management | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 6 | HA513 | Community Healthcare Management | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 7 | HA514 | Study Tour Report | Core | 0 | 3 | 0 | 25 | 25 | 50 | -- | 50 | 0:0:3 | 3 |
| 8 | HA515 | Dissertation | Core | 0 | 0 | 12 | 25 | 25 | 50 | -- | 50 | 0:0:6 | 6 |
| Total | | | | 12 | 9 | 12 | 290 | 170 | 470 | 240 | 700 | 27 | 27 |

L: Lecture

T: Tutorials

P: Practical

C: Credit

CT: Class Test

TA: Teacher Assessment

ESE: End Semester Examination

Sessional Total: Class Test + Teacher Assessment

Subject Total: Sessional Total + End Semester Examination (ESE)



Integral University, Lucknow

| | | | | | | | |
|--|---|----------------------------|--|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA508 | Title of the Course | Managerial Skill Development for Healthcare Professional | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | To familiarize the student with hospital Managerial Skill. The student shall understand the process of Development for Healthcare Professional in a health care establishment, apart from productivity aspects. | | | | | | |

| Course Outcomes | |
|------------------------|---|
| CO1 | To provide basic understanding of the evaluation and management concepts. |
| CO2 | To provide basic understanding of principle and functions of management. |
| CO3 | To understand the importance of planning in management. |
| CO4 | Explain the principle and procedure of official communication. |
| CO5 | Explain the process of effective organizational communication. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|--|---------------------|------------------|
| 1 | Development of Management Concepts | Evaluation of management theory, Management as a profession, Traditional vs Modern Management, Theories of Management | 07 | CO1 |
| 2 | Management function and tools | Management Levels and skills, Function and Principles of management, Challenges to Managers in healthcare setup | 07 | CO2 |
| 3 | Fundamental of Planning | Planning, Steps in planning, Nature and Process of managerial decision making, Planning Premises | 08 | CO3 |
| 4 | Office Procedure | Definition of office, Drafting official letters office procedure, Covering letters, Resume Writing, Report Writing, Group Discussion | 07 | CO4 |
| 5 | Communication | Basic concept, Types of Communication, Principle of good communication, Patient care and communication, Art of Public Speaking | 06 | CO5 |

| | |
|---------------------------|---|
| Reference Books: | |
| 1. | Service Marketing Management |
| 2. | Advertising Management |
| 3. | Francis CM, Mario C de Souza: Hospital Administration, New Delhi, 2000. |
| 4. | Reaction of patients towards evening OP services in Delhi Hospitals, Hospital Administration, 14 (13), 1977. |
| 5. | Chakravarthy S: Planning of Surgical Suites, National workshop on hospital planning and Design, AIIMS, New Delhi, 1987. |
| 6. | Prabhu KM, Sood SK: Hospital Laboratory Services Organization and Management, Journal of Academy of Hospital Administration, 2(@) 1990. |
| 7. | S.L. GOEL, Healthcare Management and Administration, Deep & Deep Publications Pvt. Ltd., New Delhi. |
| e-Learning Source: | |
| 1. | https://www.youtube.com/watch?v=-OhmAGm8XmE |
| 2. | https://www.youtube.com/watch?v=FpQEwbAV3Qw |
| 3. | (184) Webinar on Strategic Procurement Speaker: Manoj Kulkarni Yermalkar - YouTube |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 3 | 1 | 3 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|--|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA508 | Managerial Skill Development for Healthcare Professional | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | √ | √ | √ | | | √ | √ | |



Integral University, Lucknow

| | | | | | | | |
|--|---|----------------------------|----------------------|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA509 | Title of the Course | Healthcare Insurance | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | To familiarize the student with hospital operational activities in terms of Health insurance. The student shall understand the process of Health insurance application in Hospital sectors. | | | | | | |

| Course Outcomes | |
|------------------------|--|
| CO1 | To explain the meaning and nature of Front Office-Admission. Students should also relate Health Insurance policy in India. |
| CO2 | Students should be able to Understand about the Health Care policies management. |
| CO3 | They should understand the concepts supporting Administration of health Insurance. |
| CO4 | To acquire knowledge about Health Insurance Taxation of the hospital. |
| CO5 | To understand the process of Health Insurance Providers. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|---|---------------------|------------------|
| 1 | Introduction | Introduction – Economics of Life and Health Insurance – Importance, sociopolitical realities Insurance terminology | 07 | CO1 |
| 2 | Health Policy | Health Policy visà-vis Health Insurance Policies.- Indian scenario – different products – demand and scope - limitations | 07 | CO2 |
| 3 | Administration of health Insurance | Administration of health Insurance Schemes like CGHS & ESI and Social Security Measures.TPAs, Governing mechanisms including IRDA | 08 | CO3 |
| 4 | Health Insurance Taxation | Health Insurance Taxation. Standardization and grading of hospital services Role of vigilance and real-time information about the services | 07 | CO4 |
| 5 | Health Insurance Providers | Health Insurance Providers – Government and Private - Micro insurance, The role and responsibilities of provider-insurer- patient and the regulatory agencies | 06 | CO5 |

| | |
|--|--|
| Reference Books: | |
| 1. Gupta, P.K., <i>Insurance and Risk Management</i> , Himalaya Publishing House, 2004. | |
| 2. Sakharkar BM, <i>Principles of hospitals administration and planning</i> , Jaypee Brothers publications. | |
| 3. Francis CM, Mario C de Souza: <i>Hospital Administration</i> , New Delhi, 2000. | |
| 4. Reaction of patients towards evening OP services in Delhi Hospitals, <i>Hospital Administration</i> , 14 (13), 1977. | |
| 5. Chakravarthy S: <i>Planning of Surgical Suites</i> , National workshop on hospital planning and Design, AIIMS, New Delhi, 1987. | |
| e-Learning Source: | |
| 1. https://www.youtube.com/watch?v=-OhmAGm8XmE | |
| 2. https://www.youtube.com/watch?v=FpQEwbAV3Qw | |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 2 |
| CO2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 1 | 2 |
| CO4 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|----------------------|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA509 | Healthcare Insurance | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | √ | √ | √ | | | √ | √ | |



Integral University, Lucknow

| | | | | | | | |
|-------------------|---|---------------------|---------------------------------|---|---|---|---|
| Course Code | HA510 | Title of the Course | Medico legal Issues in Hospital | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | To familiarize the student with hospital operational activities. The student shall understand the process of purchase and inventory management in a health care establishment, apart from productivity aspects. | | | | | | |

| Course Outcomes | |
|-----------------|--|
| CO1 | Enlist the Indian laws applicable to hospital establishment and its functioning |
| CO2 | Enlist the ethical issues in Hospital |
| CO3 | Appreciate the medico-legal implications associated with day-to-day hospital operations |
| CO4 | Apply tools and techniques to fulfill the obligations of a hospital to respect the Patients' right |
| CO5 | Enlist the Indian laws applicable to hospital establishment and its functioning. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|----------|-------------------------------|--|--------------|-----------|
| 1 | Laws applicable to hospital | Medico - Legal Problems in relation to health administration (medical & labor laws), Medical-legal functions of hospital - Medico-legal report, Postmortem report, Medical certificate. | 07 | CO1 |
| 2 | | Medical Laws: Clinical Establishment Act, Biomedical Waste (Management & Handling) Rules, 1998, PNDT Act, 1994, Transplantation of Human Organs Act, 1994, Right to Information Act, 2005, Consumer Protection Act, 1986, Clinical Trial & Patient safety, International Health Legislations, Infectious Disease Notification, The Epidemic Diseases Act, 1925, MTP Act, Act, Laws pertaining to establishment & licensing of diagnostic & laboratory services, Birth & Death registration, reporting of health events, etc.; Regulation of Pharmaceutical Industry – Drugs and Cosmetics Act, 1940 etc. | 07 | CO2 |
| 3 | Patients' Right in a Hospital | Right to health – International perspective, Role of WHO, Health as a human Right, health insurance, Constitutional perspective – National Perspective, Regulation of public Health & Private Health, Enforcement Mechanism, Provision of service during Emergency, citizen charter | 08 | CO3 |
| 4 | | Medical Negligence: Liability of Doctors and Hospital for Medical negligence – Liability of doctors: Under Law of Torts and Consumer Protection Act, Liability for the use of Medical device, Criminal liability of Doctors, Management of Hospital and Legal Regulations. | 07 | CO4 |
| 5 | Ethical Issues in Hospital | Ethical Issues in Hospital: principles (confidentiality, autonomy, non-maleficence, beneficence, justice, fairness, truthfulness), application of ethics in healthcare, identifying and clarifying ethical dilemma, Analyzing alternative courses of action and its consequences, Resolving the dilemma by choosing best course of action, Ethics in clinical trials. | 06 | CO5 |

Reference Books:

1. Law and Medical Profession by Eastern Law Book Co.
2. Robert D. Miller and Rebecca C. Hutton, problems in Health care law, [2000], Aspen Publication, Maryland.
3. National Health Programs of India: National policies and legislation related to health, by Jugal Kishore. Century Publications, 11th Edition (2014)
4. Sonu Goel, Anil Kumar Gupta and Amarjeet Singh (2014). (Editors). Hospital Administration – A Problem-Solving Approach. New Delhi: Elsevier.

e-Learning Source:

1. <https://www.youtube.com/watch?v=-OhmAGm8XmE>
2. <https://www.youtube.com/watch?v=FpQEwbAV3Qw>
3. (184) Webinar on Strategic Procurement || Speaker: Manoj Kulkarni Yermalkar - YouTube

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|--|-----|-----|-----|-----|-----|------|------|------|------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|-------------|---------------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| HA510 | Medico legal Issues in Hospital | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | | √ | √ | | | √ | √ | |



Integral University, Lucknow

| | | | | | | | |
|--|--|----------------------------|--|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA511 | Title of the Course | Enterprise Resource Planning for Hospitals | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | To familiarize the student with hospital Enterprise Resource Planning (ERP) activities. The student shall understand the process of Enterprise Resource Planning (ERP) & Functional Hospital Organization. | | | | | | |

| Course Outcomes | |
|------------------------|---|
| CO1 | To explain the meaning and nature of Introduction to Enterprise Resource Planning (ERP) |
| CO2 | Students should be able to Understand about the ERP Implementation Lifecycle |
| CO3 | They should understand the concepts Functional plans for hospital construction |
| CO4 | To acquire knowledge about Functional Hospital Organization |
| CO5 | To understand the process of controlling and types of Supportive Services |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|---|---------------------|------------------|
| 1 | Introduction to Enterprise Resource Planning (ERP) | Information System and Its Components, Value Chain Framework, Organizational Functional Units, Evolution of ERP Systems, Role of ERP in Organization, Three-Tier Architecture of ERP system | 07 | CO1 |
| 2 | ERP Implementation Lifecycle | Project Preparation, Initial Costing, Requirement Engineering, ERP Solution Selection, Technical Planning, Change Management and Training Plan, Implementation and Deployment Planning, Configuration, Custom Coding, Final Preparation, Go-live | 07 | CO2 |
| 3 | Functional plans for hospital construction | Role of hospital consultant, planning stage: role of architect, working drawings, legal formalities, the hospital site, design considerations, environments regulations, equipment planning, bed distribution, space requirements, their relationships, construction costs. | 08 | CO3 |
| 4 | Functional Hospital Organization | Hospital code of ethics, medical ethics, standards for hospitals, standards for hospital accreditation, accreditation standards for extended care facilities. Medical Specialties Overview of the functions and sphere of each specialty: oncology, general medicine, cardio thoracic gastroenterology, urology, radiology, psychiatry, endocrinology, neurology, ophthalmology, medical services, surgical services, operation theatre, maternity services, dental services. | 07 | CO4 |
| 5 | Supportive Services | Clinical Laboratories, radiological services, medical records, front office, billing, staffing, house keeping, transportation, dietary services, emergency services, infection control, and mortuary services | 06 | CO5 |

| | |
|---------------------------|---|
| Reference Books: | |
| 1. | Hospital Planning, WHO, Geneva, 1984 |
| 2. | Kunders G.D., Gopinath S., and Katakam A. Hospital Planning, Design and Management, Tata McGraw Hill, New Delhi, 1999 |
| 3. | Arun Kumar, (ed) Encyclopedia of Hospital Administration and Development, Anmol publications, New Delhi, 2000. |
| 4. | Srinivasan, A.V. (ed), Managing a Modern Hospital, Chapter 2, Response Books, New Delhi, 2000. |
| 5. | Padmanand V. and P.C. Jain, Doing Business in India, Response Books, New Delhi, 2000. |
| e-Learning Source: | |
| 1. | https://www.youtube.com/watch?v=-OhmAGm8XmE |
| 2. | https://www.youtube.com/watch?v=FpQEwbAV3Qw |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| CO4 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|--|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA511 | Enterprise Resource Planning for Hospitals | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | √ | √ | √ | | | √ | √ | |



Integral University, Lucknow

| | | | | | | | |
|--|---|----------------------------|---------------------------------------|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA512 | Title of the Course | Hospital Hazards and Waste Management | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | At the end of this course, students will be able to understand about the Hospital Hazards and Waste Management. | | | | | | |

| Course Outcomes | |
|------------------------|--|
| CO1 | Enumerate possible hazards and its sources in a hospital. |
| CO2 | Apply tools and techniques to address occupational and injection safety issues in a hospital setup |
| CO3 | Appreciate the significance of Biomedical Waste management and its safe disposal. |
| CO4 | Enlist the best practices in the field of hospital infection prevention and control. |
| CO5 | Apply universal standards and precautions in hospital settings. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|---|---|---------------------|------------------|
| 1 | Hospital Associated Infection Management | Overview, hand-hygiene, use of personal protection equipment, vaccination of health staffs, transmission-based precautions Organizational structure of infection control – Hospital infection control committee, infection control team, infection control manual, role of physicians, role of microbiologists, role of nursing staffs | 07 | CO1 |
| 2 | Injection Safety | Definition & scope, current scenario – global & Indian, best practices, injection waste disposal, Newer technologies – auto-disable & re-use prevention syringes, pre-filled injection devices, safety syringes, vacuum based technology for drawing blood, safety needles & cannulas Surveillance to strengthen safe injection practices, relevance of hospital infection control committee in providing safe injections | 07 | CO2 |
| 3 | Occupational Safety | Health & safety issues in healthcare settings, economic benefit & value of occupational health & safety, comprehensive approach for patient & worker safety, risk assessment, exposure of various categories of hospital staffs to hazards, prevention of hazards specific to health sector – Biological, Blood borne pathogens, other infections. Safety practices in hospital – Universal precautions, hygienic hand disinfection, immunization, personal protective gears, sharps management, post-exposure management, safe handling of BMW, response to injury & exposure, needle stick injury, cytotoxic chemical exposure. | 08 | CO3 |
| 4 | Biomedical Waste Management | Introduction, types & composition of biomedical wastes - (Liquid BMW, Radioactive waste, Metals, Chemicals, Drug waste), health hazards & risks, Systematic BMW disposal- Segregation, collection, transportation, disposal, Management & methods of disinfection, Modern technology for handling BMW, Monitoring & controlling of cross infection (Protective devices), BMW from Administrative point of view (Budget, Health check-up, Insurance) | 07 | CO4 |
| 5 | Radioactive Waste | Management of radioactive wastes in hospitals - Dilute and Disperse, Delay and Decay, Concentrate & Contain (Rarely used), special considerations – sealed sources, gaseous waste, cadavers with radioactive material, regulatory bodies (ICRP, AERB) & record keeping, Radiation safety officer. Basic concepts, measuring activity of radioactive material, relative biological effectiveness, half-life of a radio-isotope, Tenth value thickness, radiation measuring & monitoring devices – well counter, dose calibrator, Film badge, TLD badge, pocket Dosimeter, etc. Classification of radioactive waste – according to level of activity, according to the form, according to the half-life. | 06 | CO5 |

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| Reference Books: | |
| 1. | Bio-Medical Waste Act & Rules Govt. of India |
| 2. | Current Issues In BMW Waste Handling-ISHA, Bangalore |
| 3. | Khan S, Syed AT, Ahmad R, Rather TA, Ajaz M, Jan FA (2010). Radioactive waste management in a hospital. International Journal of Health Sciences, 4(1): 43-51. |
| 4. | BMW management by J Kishore, Century Publications |
| 5. | Sonu Goel, Anil Kumar Gupta and Amarjeet Singh (2014). (Editors). Hospital Administration – A Problem-Solving Approach. New Delhi: Elsevier |
| e-Learning Source: | |
| 1. | https://www.youtube.com/watch?v=-OhmAGm8XmE |
| 2. | https://www.youtube.com/watch?v=FpQEwbAV3Qw |
| 3. | (184) Webinar on Strategic Procurement Speaker: Manoj Kulkarni Yermalkar - YouTube |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

2- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|---------------------------------------|-------------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|-----------------|
| HA512 | Hospital Hazards and Waste Management | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | |

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Integral University, Lucknow

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|--|---|----------------------------|---------------------------------|--|--|--|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | | | | |
| Course Code | HA513 | Title of the Course | Community Healthcare Management | | | | L | T | P | C |
| Year | II | Semester | IV | | | | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | | | | |
| Course Objectives | To familiarize the student with hospital operational activities. The student shall understand the process of purchase and inventory management in a health care establishment, apart from productivity aspects. | | | | | | | | | |

| Course Outcomes | |
|-----------------|--|
| CO1 | Will be able to gain understandings on the concepts and dimensions of healthcare services. |
| CO2 | Will be able to get familiarity on current issues in community health. |
| CO3 | Will be able to get in-depth knowledge on the various health promotion activities. |
| CO4 | Get introduced to the concept of planning and promotion of health education. |
| CO5 | Get familiarized with Chronic disease management & Consumer health. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|----------|-------------------|--|--------------|-----------|
| 1 | UNIT-1 | Definition, concepts, determinants & dimensions of health; Health sickness spectrum; Levels of health care; Concepts of disease causation; Levels of disease prevention; Social medicine & Social control of medicine; Community Diagnosis; Quality of life; Right to health; Indicators of health; Health services philosophies; Health services research. | 07 | CO1 |
| 2 | UNIT-2 | Current issues in community health; Etiology and treatment options for common chronic and communicable diseases; primary, secondary, and tertiary measures to prevent and treat conditions most prevalent at the community level. | 07 | CO2 |
| 3 | UNIT-3 | Health promotion in the workplace: A healthy and safe workplace; Occurrence and prevention of injuries; Occupational stress; Occupational safety and health; Women's health; AIDS; Violence; Alcohol, tobacco and illegal drugs use; Proper use of medications- prescription and non-prescription. | 08 | CO3 |
| 4 | UNIT-4 | Communication, Programme planning and evaluation in health education and promotion: Community needs assessment; Planning for health education and promotion programs in a variety of settings; Issues relating to implementation of programs; Monitoring and Evaluation. Principles of Health Education; Health informatics | 07 | CO4 |
| 5 | UNIT-5 | Chronic disease management & Consumer health: Prevention and control of chronic lifestyle diseases; common barriers to healthy lifestyles; evaluation of health services and products; medical quackery; efficiently using health services; consumer protection; alternative and complementary therapies (AYUSH); food selection; influences of advertising on consumer choices. | 06 | CO5 |

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| Reference Books: | |
| 1. | B. Sridhar Rao, Textbook of Social Medicine, 2nd Edition, 2010, AITBS Publishers, India |
| 2. | Ajit K. Dalal, Social Dimensions of Health, Rawat Publishers, 2005, New Delhi, India |
| 3. | Seth B. Goldsmith, Principles of Health Care Management, Jones & Bartlett Publishers, 2005, UK |
| 4. | Park K. Park's Textbook of Preventive and Social Medicine, 22nd Edition, Banarsidas Bhanot Publishers, Jabalpur, India 2012. |
| 4. | Chakravarthy S: Planning of Surgical Suites, National workshop on hospital planning and Design, AIIMS, New Delhi, 1987. |
| 5. | Prabhu KM, Sood SK: Hospital Laboratory Services Organization and Management, Journal of Academy of Hospital Administration, 2(@) 1990. |
| 6. | S.L. GOEL, Healthcare Management and Administration, Deep & Deep Publications Pvt. Ltd., New Delhi. |
| e-Learning Source: | |
| 1. | https://www.youtube.com/watch?v=-OhmAGm8XmE |
| 2. | https://www.youtube.com/watch?v=FpQEwbAV3Qw |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|--|-----|-----|-----|-----|-----|------|------|------|------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

3- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------|---------------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| HA513 | Community Healthcare Management | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | √ | √ | √ | | | √ | √ | |



Integral University, Lucknow

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|--|--------------|----------------------------|--------------------------|----------|----------|----------|----------|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | HA514 | Title of the Course | Study Tour Report | L | T | P | C |
| Year | II | Semester | IV | 2 | 1 | 0 | 3 |
| Pre-Requisite | None | Co-requisite | None | | | | |
| Course Objectives | | | | | | | |

| Course Outcomes | |
|------------------------|---|
| CO1 | The main purpose of the study tour is visit the different setup of the hospital and Healthcare sectors. |
| CO2 | |
| CO3 | |
| CO4 | |
| CO5 | |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|-----------------|--------------------------|------------------------|---------------------|------------------|
| 1 | | | 07 | CO1 |
| 2 | | | 07 | CO2 |
| 3 | | | 08 | CO3 |
| 4 | | | 07 | CO4 |
| 5 | | | 06 | CO5 |

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|-------------------------|--|--|--|--|
| Reference Books: | | | | |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |

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| e-Learning Source: | | | | |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

| Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | |
|---|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| PO-PSO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | -- | -- | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 |
| CO4 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

4- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|--------------------|--------------------------|----------------------|-------------------------|--------------------------|------------------------|---|--------------------|----------------------------|-----------------|
| HA514 | Study Tour Report | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 4 |
| | | | √ | √ | | | √ | √ | |

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|--|--|---|----|----|--|----------------|---|---|-----------|
| | | y | ip | nt | | Sustainability | | | |
| | | √ | √ | √ | | | √ | √ | 3,4,9, 17 |