CURRICULUM

OF

DISASTER MANAGEMENT

MS

(2018)

HIGHER EDUCATION COMMISSION
ISLAMABAD
CURRICULUM DIVISION, HEC

Prof Dr. Mukhtar Ahmed  Chairman, HEC
Mr. Fida Hussain  Director General (Acad)
Mr. Rizwan Shoukat  Deputy Director (Curri)
Mr. Abid Wahab  Assistant Director (Curri)
Mr. Riaz-ul-Haque  Assistant Director (Curri)

Composed by: Mr. Zulfiqar Ali, HEC, Islamabad


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The curriculum, with varying definitions, is said to be a plan of the teaching-learning process that students of an academic programme are required to undergo. It includes objectives & learning outcomes, course contents, scheme of studies, teaching methodologies and methods of assessment of learning. Since knowledge in all disciplines and fields is expanding at a fast pace and new disciplines are also emerging; it is imperative that curricula be developed and revised accordingly.

University Grants Commission (UGC) was designated as the competent authority to develop, review and revise curricula beyond Class-XII vide Section 3, Sub-Section 2 (ii), Act of Parliament No. X of 1976 titled “Supervision of Curricula and Textbooks and Maintenance of Standard of Education”. With the repeal of UGC Act, the same function was assigned to the Higher Education Commission (HEC) under its Ordinance of 2002, Section 10, Sub-Section 1 (v).

In compliance with the above provisions, the Curriculum Division of HEC undertakes the revision of curricula after every three years through respective National Curriculum Revision Committees (NCRCs) which consist of eminent professors and researchers of relevant fields from public and private sector universities, R&D organizations, councils, industry and civil society by seeking nominations from their organizations.

In order to impart quality education which is at par with international standards, HEC NCRCs have developed unified templates as guidelines for the development and revision of curricula in the disciplines of Basic Sciences, Applied Sciences, Social Sciences, Agriculture and Engineering in 2007 and 2009.

It is hoped that this curriculum document, prepared by the respective NCRC’s, would serve the purpose of meeting our national, social and economic needs, and it would also provide the level of competency specified in Pakistan Qualification Framework to make it compatible with international educational standards. The curriculum is also placed on the website of HEC (www.hec.gov.pk).

(Muhammad Raza Chohan)
Director General (Academics)
CURRICULUM DEVELOPMENT PROCESS

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<td>IMPLE.OF CURRI.</td>
<td>BACK TO STAGE-I</td>
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Abbreviations Used:
CRC. Curriculum Revision Committee
VCC. Vice Chancellor’s Committee
EXP. Experts
COL. Colleges
UNI. Universities
PREP. Preparation
REC. Recommendations
**Minutes of National Curriculum Revision Committee (NCRC) Preliminary Meeting in Disaster Management held from January 08-10, 2018 at HEC Regional Centre, Peshawar**

The preliminary meeting of National Curriculum Revision Committee (NCRC) in the discipline of Disaster Management for Bachelor and MS degree programmes was held from 08-10 January, 2018 (03 days) at HEC, Regional Center, Peshawar. Experts from academia, civil society, national and international organization and industry participated in the meeting. Dr. Muhammad Idrees (Director, Academics Division, HEC, Pakistan) coordinated the NCRC meeting. The list of the participants is as below:

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Designation</th>
<th>Position/Institute</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dr. Noor Jehan</td>
<td>Director / Professor</td>
<td>Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Convener</td>
</tr>
<tr>
<td>2.</td>
<td>Dr. Syed Ainuddin</td>
<td>Chairman / Associate Professor, Department of Disaster and Development Studies Faculty of Social Sciences, and Chairman, Under Graduate Studies Office, University of Baluchistan, Quetta.</td>
<td>Co-Convener</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. Atta-ur-Rahman</td>
<td>Associate Professor</td>
<td>Department of Geography, Faculty of Life and Environmental Sciences, University of Peshawar, Peshawar</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Secretary</td>
</tr>
<tr>
<td>4.</td>
<td>Prof. Dr. Amir Nawaz Khan</td>
<td>Meritorious Professor</td>
<td>Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar</td>
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<td></td>
<td></td>
<td></td>
<td>Member</td>
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<tr>
<td>5.</td>
<td>Prof. Dr. Sajid Rashid Ahmad</td>
<td>Principal / Professor</td>
<td>College of Earth &amp; Environmental Sciences, University of the Punjab, Quaid-i-Azam Campus, Lahore.</td>
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<td></td>
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<td>Member</td>
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<tr>
<td>6.</td>
<td>Dr. Mobushir Riaz Khan</td>
<td>Director / Professor</td>
<td>University Institute of Information Technology, PMAS, Arid Agriculture University, Rawalpindi.</td>
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<td>Member</td>
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<tr>
<td>7.</td>
<td>Prof. Dr. Qaiser uz Zaman Khan</td>
<td>Professor, Department of Civil Engineering, University of Engineering &amp; Technology, Taxila</td>
<td>Member</td>
</tr>
<tr>
<td>8.</td>
<td>Dr. Shaker Mahmood Mayo</td>
<td>Professor, Faculty of Architecture &amp; Planning, Department of City &amp; Regional Planning,</td>
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<td></td>
<td>Member</td>
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<td>No.</td>
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<td>9.</td>
<td>Dr. Safdar Ali Shirazi</td>
<td>Director / Associate Professor, Center for Integrated Mountain Research, University of the Punjab, Quaid-i-Azam Campus, Lahore.</td>
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<td>10.</td>
<td>Dr. Naeem Shahzad</td>
<td>Chairman/Associate Professor, Military College of Engineering, Civil Engineering Wing, National University of Science &amp; Technology, Risalpur.</td>
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<td>11.</td>
<td>Dr. Salah Uddin</td>
<td>Associate Professor, Department of Civil Engineering, Baluchistan University of Engineering &amp; Technology, (BUET), Khuzdar</td>
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<tr>
<td>12.</td>
<td>Dr. Naveed Ahmad</td>
<td>Assistant Professor, Earthquake Engineering Centre, University of Engineering &amp; Technology, Peshawar.</td>
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</tr>
<tr>
<td>13.</td>
<td>Dr. Javed Akhter Qureshi</td>
<td>Assistant Professor, Department of Earth Sciences, Karakoram International University, Main Campus, University Rd, Gilgit-Baltistan</td>
<td></td>
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<tr>
<td>14.</td>
<td>Dr. Amjad Ali</td>
<td>Assistant Professor, Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar.</td>
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<tr>
<td>15.</td>
<td>Dr. Saleem Ullah</td>
<td>Assistant Professor, Department of Space Science, Institute of Space Technology, Islamabad.</td>
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<tr>
<td>16.</td>
<td>Dr. Muhammad Ashraf</td>
<td>Assistant Professor, Department of Disaster Management &amp; Development Studies, University of Baluchistan, Quetta.</td>
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<tr>
<td>17.</td>
<td>Mr. Mushtaq Ahmad Jan</td>
<td>Assistant Professor, Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar.</td>
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<tr>
<td>18.</td>
<td>Mr. Muhammad Ahmed</td>
<td>Lecturer, Department of Urban &amp; Infrastructure Engineering, NED University of Engineering &amp; Technology, Karachi.</td>
<td></td>
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<tr>
<td>19.</td>
<td>Mr. Shakeel Mahmood</td>
<td>Lecturer, Department of Geography, Government College University, Lahore.</td>
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<tr>
<td>20.</td>
<td>Dr. Muhammad Hanif</td>
<td>Director, National Weather Forecasting Center, Pakistan Meteorological Department, Sector H-8/2,</td>
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</table>
### National Curriculum Review Committee Agenda

The agenda of NCRC for Disaster Management is as follows:

1. To revise/update the curriculum of Disaster Management (2013) for Bachelor and MS degree programs according to indigenous needs and to bring it at par with international standards.
2. To revise/update/add preface/ preamble and rationale of the subject.
3. To develop and revise programme objectives, learning outcomes (LOs), teaching methods and assessment criteria (formative & summative).
4. To incorporate/suggest latest reading materials/references (local & international) for every course.
5. To revise/update course contents keeping in view the uniformity across other disciplines and avoiding overlapping.
6. To make recommendations for promotion/development of the discipline, keeping in view the futuristic needs of the society and international trends.

The meeting started with recitation from the Holy Quran. Dr. Muhammad Idrees, Director Curriculum, HEC welcomed the members on behalf of Chairman and higher authorities of HEC. All the participants introduced themselves highlighting their qualification, experience and area of expertise. Keeping with the tradition, Dr. Muhammad Idrees, Director Academics Division, HEC, Islamabad offered the house to nominate the Convener and Secretary of the NCRC for smooth functioning. Prof. Dr. Noor Jehan, Director/Professor, Centre for Disaster Preparedness and Management, University of Peshawar and Dr. Syed Ainuddin, Chairman/Associate Professor, Department of Disaster & Development Studies, Faculty of Social Sciences, University of Baluchistan, Quetta and Dr. Atta-ur-Rahman, Associate Professor, Department of Geography, Faculty of Life and Environmental Sciences, University of Peshawar, Peshawar were selected unanimously as Convener, Co-convener and Secretary, respectively.

In second session, Prof Dr. Noor Jehan presented the agenda and objectives of the NCRC. He highlighted the importance of this meeting and emphasized for adaptation of general rules of curriculum development and revision like scope of the subject/programme, horizontal & vertical alignment, rule of flexibility and adaptability keeping in view the futuristic approach, market value/job market and societal needs. He also shared a template for revising/updating the curricula according to paradigm shift of including learning outcomes (according to Bloom’s Taxonomy), teaching methods and assessment. The template was unanimously accepted to be followed. It was also agreed to add preamble, program objectives, program learning outcomes, teaching methodology and assessment segments in the curricula.

Prof. Dr. Amir Nawaz Khan, briefed the participants about outcome of previous NCRC meetings, as he acted as Convener of previous NCRC in the field of Disaster Management. He informed the participants that key objective of previous NCRC was to devise a curriculum that provides a unified framework (guidelines) to institutions offering degrees under the title of Disaster Management. The house unanimously agreed to pursue the same track for development of Curriculum in field of Disaster Management.
In next session the house openly discussed the nomenclature of the discipline, preface, objectives of the programme, learning outcomes, methods of instruction and learning environment, assessment and operational framework. After long deliberation, the committee finalized the nomenclature, framework/scheme of studies, the duration of the programme, number of semesters, number of weeks per semester, total number of credit hours, number of credit hours per semester, weightage of breadth and depth courses and weightage of theory and practical of undergraduate 4-years programme for Disaster Management. Furthermore, list of courses (core & elective) and semester wise breakup of courses were also discussed thoroughly and the same was unanimously finalized.

In the afternoon session, admission criteria/intake criteria was discussed and finalized. After that the list of courses was distributed among the members; keeping in view the experience and expertise in the field for reviewing course objectives, adding course learning outcomes, updating list of contents, adding teaching-learning methods and assessment, and updating bibliography/references/suggested books. The list of courses assigned to members is at Annex-I.

On second day, courses developed/improved by individual members and compiled by secretary were presented. Each course was discussed in the whole group and with through discussion on course objectives, learning outcomes, contents, teaching methods, assessment and reference books were reviewed, revised and finalized. After thorough deliberation, draft curriculum of the undergraduate (4-years) programme for Disaster Management was finalized. In the evening session, the courses of postgraduate programme was distributed among the members, who were well versed and involved in this programme. The list of courses assigned to members is at Annex-II.

On third day, the secretary briefed the house about progress made on the previous day. The courses of postgraduate programme of Disaster Management were reviewed and compiled by secretary and presented in the committee. After through discussion and deliberation courses were reviewed, revised and finalized. It was decided that the draft curriculum of Disaster Management would be circulated among the experts of field (local & foreign) and the feedback of the experts will be incorporated in final meeting.
At the end the Convener thanked the Co-convener, Secretary and all the members of the Committee for sparing their time and for their contribution to prepare the revised draft of the curriculum. They further stated that their efforts will go a long way in developing workable, useful and market oriented comprehensive degree programme in Disaster Management. The Convener and Co-convener of the NCRC also thanked the members for their inputs in revising/updating the curriculum to make it more practical, competitive, efficient and realistic. The committee highly appreciated the efforts made by the officials of HEC Regional Centre, Peshawar for making arrangements to facilitate the committee and their accommodation and recreation tour. The meeting ended with the vote of thanks to HEC and Dr. Muhammad Idrees and his team from HEC for providing this academic and professional opportunity for national cause.
VISION

Transformation and contribution towards national integration and consolidation to overcome the sense of forlornness and alienation in vulnerable communities.

MISSION

To impart knowledge and skills to effectively manage disasters.

RATIONALE

Disasters, natural or man-made result in untold misery on the human beings and adverse impacts on the community. The frequency and intensity of Disasters are mounting with every passing day as experienced in the past decade. The ability to manage and mitigate disaster assumes paramount importance. Disaster management is understood as the managerial function charged with creating the framework, within which communities reduce vulnerability to hazards and cope with disasters. The function of disaster managers is to evaluate risk and exposure, create response plans and ensure response capacity after an event. The response capacity to disaster becomes complete when the community is involved in the entire disaster management cycle.

The recent International Conference held in Sendai, Japan has formulated a new framework for Disaster Risk Reduction (SFDRR) which has superseded the Hyogo Framework for Action (HFA). The close inter-linkages between sound Disaster Risk Reduction, environmental management and climate change impacts require a more systematic and comprehensive approach to disaster management. Considering the importance of Disaster Management for all professions (doctors, engineers, military officers, social scientists, logisticians, risk managers, decision makers, etc.) proper education and training is required. There is a severe shortage of qualified and trained professionals in this field. Therefore, a broad array of people either working or looking for jobs in the national authorities, international organizations (UN, NGOs, etc.), public services (health, energy, water) and relief/aid organizations can benefit from this program.

SCOPE

Disaster Management is an inter-disciplinary and multi-disciplinary academic field devoted to various aspects of disaster management across societies and cultures. This program aspires to provide disaster management professionals and specialists for public and private sector Organizations, Institutions and Authorities who can plan, manage, and evaluate interventions in the field of disaster management.

PROGRAM LEARNING OUTCOMES

PLO 1. Disaster Management Knowledge: An ability to apply knowledge of science to the solution of complex disaster problems.

PLO 2. Design/Development of Solutions: An ability to design solutions for prevention, preparedness, mitigation and response to disaster situations.
PLO 3. **Investigation**: An ability to carry out vulnerability and risk assessments in a methodical way.

PLO 4. **Modern Tool Usage**: An ability to create, select and apply appropriate techniques, resources, and modern tools to complex disaster activities.

PLO 5. **Individual and Team Work**: An ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings.

PLO 6. **Communication**: An ability to communicate effectively, orally as well as in writing on complex disaster management projects with the community and society at large.

PLO 7. **Project Management**: An ability to demonstrate management skills and apply disaster management knowledge to one’s own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.

PLO 8. **Ethics**: An ability to apply ethical principles and commit to professional ethics and responsibilities and norms of disaster management practices

**AIMS AND OBJECTIVES**
The following objectives were considered to prepare curricula for BS in Disaster Management:

i. To develop international standard Disaster Management curriculum for 4 years BS and 2 years MS curriculum so that the uniformity could be adopted by the public and private sector institutions throughout the country.

ii. To impart current knowledge and practical skills to Disaster Management graduates through theory, practical and field exercises.

Keeping in view the mandate of the NCRC on Disaster Management, following decisions were made, accordingly.

**TITLE OF THE DEGREE**
The title of the degree for BS and MS was discussed by the committee. The committee unanimously approved “**Disaster Management**” as the title of all the degree programmes to be offered by the HEIs in Pakistan.
Scheme of Study for MS programme in

“Disaster Management”
Scheme of Study for MS programme in “Disaster Management”

ELIGIBILITY:

1. Preference will be given to BS 4 years / MSc. (16 years of education) Disaster Management degree (HEC recognized institutes/universities) for admission in 2 years MS Disaster Management programme.

2. Those candidate having BS 4 years / MSc. in any of the subject of Earth Sciences, Environmental Sciences, Geography, Space Sciences, Biological Sciences, Management Sciences, Agriculture Sciences, Medical Sciences, Economics, Sociology, Psychology, Forestry, Architecture, Civil / Agriculture / Mining Engineering, City / Urban & Regional Planning shall have to enrol in prerequisite and/or deficiency courses as proposed by the individual Department/university and as per HEC prescribed guidelines.

DURATION AND COURSE STRUCTURE:

2 years spread over 4 semesters (two semesters per year)

DEGREE REQUIREMENT: 30 CREDIT HOURS INCLUDING THESIS

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<th>Course Structure</th>
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<tr>
<td>Deficiency courses (Fundamental Courses, 0 Semester)</td>
<td>As required*</td>
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<tr>
<td>Core courses (First semester)</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Elective/specialized (Second semester)</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Thesis (Third &amp; Fourth semesters)</td>
<td>2 (thesis)</td>
<td>06 (thesis)</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>30</td>
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* Mandatory for non-disaster managers. However, postgraduate diploma holder in disaster management (HEC Recognized) will be exempted.

EVALUATION:

For the uniformity in the evaluation system, NCRC recommends that the minimum CGPA required to pass a semester is 2.5 out of 4.0 at graduate level or decided by the respective bodies of the university as per rules in vogue.
LAYOUT OF COURSES FOR MS

Four core courses and four elective courses, each with 3 credit hours to be selected in first and second semester. Number of options that shall be offered during the course of study shall depend upon the availability of faculty and lab facilities. More groups can also be added depending on the availability of resources. More special topics could also be added to these by the board of studies of the individual departments. The respective board of studies of the departments, keeping in view the availability of staff and resources, may prepare detail outline of the course and approve it accordingly (for some of the course outline is prepared and given).

COMPULSORY AND CORE COURSES

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<th>Course Titles</th>
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<tr>
<td></td>
<td><strong>Compulsory course</strong></td>
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<tr>
<td>701</td>
<td>Research Methodology in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Major/ Core courses</strong></td>
<td></td>
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<tr>
<td>702</td>
<td>Introduction to Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>703</td>
<td>Disaster Risk Assessment</td>
<td>3</td>
</tr>
<tr>
<td>704</td>
<td>Disaster Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>705</td>
<td>Emergency Response Management</td>
<td>3</td>
</tr>
<tr>
<td>706</td>
<td>Disaster Risk and Development</td>
<td>3</td>
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<tr>
<td>707</td>
<td>Natural Hazards of Pakistan</td>
<td>3</td>
</tr>
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<td>708</td>
<td>Community Based Disaster Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>709</td>
<td>Disaster Response and Recovery</td>
<td>3</td>
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<tr>
<td>710</td>
<td>Disaster Risk Reduction and Preparedness</td>
<td>3</td>
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<tr>
<td>711</td>
<td>Fundamentals of GIS and RS in Disaster Management</td>
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<tr>
<td>712</td>
<td>Statistical Techniques in Disaster Management</td>
<td>2+1</td>
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<tr>
<td>713</td>
<td>Climate Change Adaptation and Disaster Risk Reduction</td>
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OTHER CORE/ MAJOR COURSES

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<td>721</td>
<td>Application of Geo-informatics in Disaster Management</td>
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<tr>
<td>722</td>
<td>Climate Change and Disasters</td>
<td>3</td>
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<tr>
<td>723</td>
<td>Management of Desertification Hazard</td>
<td>3</td>
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<td>724</td>
<td>Disaster Management and Economy of Pakistan</td>
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<td>725</td>
<td>Disaster Management Policies</td>
<td>3</td>
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<td>726</td>
<td>Disaster Risk and Vulnerabilities Assessment</td>
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<td>727</td>
<td>Disaster Risk Financing</td>
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<td>728</td>
<td>Disasters Risk and Urbanization</td>
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<td>729</td>
<td>Management of Drought Hazard</td>
<td>3</td>
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<td>730</td>
<td>Management of Earthquake Hazard</td>
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<td>731</td>
<td>Economics of Disasters</td>
<td>3</td>
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<td>732</td>
<td>EIA and Risk Assessment</td>
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<td>733</td>
<td>Management of Flood Hazard</td>
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<td>734</td>
<td>Forecasting of the Hydro-Meteorological Hazards</td>
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<td>735</td>
<td>Gender Mainstreaming in Disaster Management</td>
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<td>736</td>
<td>Geomorphology and Natural Hazards</td>
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<td>737</td>
<td>Hazards Mapping</td>
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<td>738</td>
<td>Management of Landslide Hazard</td>
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<td>739</td>
<td>Livelihoods and Disasters</td>
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<td>740</td>
<td>Planning and Management of Disasters in Pakistan</td>
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<td>741</td>
<td>Psychological Impacts of Disasters and its Management</td>
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<td>742</td>
<td>Sociology of Disasters</td>
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<td>743</td>
<td>Media in Disaster and management</td>
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<td>744</td>
<td>Contingency Planning in Disaster Management</td>
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<td>745</td>
<td>Peace and conflict resolution</td>
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<td>Ecosystem Based disaster Risk Reduction</td>
<td>3</td>
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**Thesis (Third & Fourth Semesters)**

MS. Thesis will be equal to six (06) credit hours in semester 3 and 4.
DETAIL OF CORE COURSES
(First Semester)
Compulsory course: DM 01

DM 701 Research Methodology in Disaster Management Cr. H. 3

COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

- Understand research and develop research design particularly in the field of Disaster Management.
- Know the methods of data collection, analysis and interpretation.

COURSE OUTLINE:

1 Scientific Research
   - Research science
   - Social research concepts and components
   - Theories and concepts
   - Hypotheses
   - Variables and causation
   - Levels of measurement
   - Reliability and validity
   - Deductive and inductive approaches
   - Inductive approach: Grounded theory

2 The Research Process
   - Research problem identification
   - Coordination schema
   - Conceptualization (research questions, problem statement, objectives and conceptual framework)
   - Operationalization
   - Construction of indicators

3 Categories of Research
   - Exploratory
   - Descriptive
   - Explanatory

4 Research Design
   - Survey (including sampling design and sample size)
   - Case study
   - Experimental design
5 Data Collection and Information Gathering

Secondary Data Collection:
- Literature study
- Analysis of articles

Primary Data Collection:
- Reconnaissance survey
- Observation
- Interviews
- Key informants
- Group discussion
- Rural Rapid Appraisal (RRA)
- Participatory Rural Appraisal (PRA)
- Questionnaire survey and pre-testing

6 Data Analysis and Interpretations

- Data processing and analysis
- Qualitative data analysis
- Quantitative data analysis
- Hypothesis testing

7 Research Proposal

- Structure
- Components

Teaching Methodology

- Lecturing
- Written Assignments

Assessment

Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Recommended Books:
**Major /Core courses**

**DM 702  Introduction to Disaster Management**  
Cr. H. 3

**Course Learning Outcomes:**
On the successful completion of the course, the students will be able to:

i. Understand the basic concepts & Principals in Disaster Management.
ii. Know the interrelation between Man and Disasters.
iii. Assess the institutions for DM in Pakistan

**Course Contents:**

**Introduction**
- Introduction to Disaster Management
- Basic Concepts in DM
- Historical evolution of DM

**Types of Disasters**
- Natural Disasters
- Anthropogenic Disasters
- Technological Disasters
- Complex Disasters

**Disaster Management Cycle**
- Basic Principals of DM
- Disaster Management Cycle

**Relationship between Man and Environment**
- Environmental Processes
- Man and Environment Theories
- Impacts of natural disasters

**Disasters Management Institutions in Pakistan**
- National Disaster Management Act and Policies
- National Disaster Management Authority (NDMA)
- Provincial Disaster Management Authorities (PDMAs)

**Recommended Books:**

DM 703 Disasters Risk Assessment Cr. H. 3

Course Learning Outcomes:
Upon Successful completion of this course, the student will be able to:
- Understand the concept of Risk in DM.
- Know the basic elements of Risk Assessment.
- Develop skills for decision making in Disasters Risk assessment

COURSE CONTENTS:

- Basic Concepts
  - Geomorphic Process,
  - Natural Hazard,
  - Disaster
  - Vulnerability
  - Capacity and Risk
- Hazard Assessment
  - Type and Nature of Occurrence
  - Location, Density, Intensity and Frequency
  - Data Availably and Quantifying the Hazards
- Vulnerability and Exposure Assessment
  - Elements at Risk and Quantifying the Elements at Risk
  - Acceptance Level and Limitations
- Capacity Assessment
  - Classification, Level and Dimension of Capacities
  - Quantifying the Capacities
- Risk Assessment
  - Characteristics of Risk
  - Dynamic Pressure
  - Underlying Causes
  - Progression of Vulnerability, and Disaster Crunch Model.
Matrix of Risk, Risk Record and the Probability of Risk

- **Decision Making**
  - Limitations of Risk Assessment
  - Cost-Benefit Analysis
  - Acceptance Level of Risks
  - Risk Management and National Development
  - Best Option Considerations

**Teaching Methodology**

- Lecturing
- Written Assignments
- Interactive Sessions

**Assessment**

*Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:*

- **1st Term (20%)**
  - Assignments/Quizzes and Presentations

- **Mid Term (30%)**
  - Written (Long Questions, Short Questions, MCQs)

- **Final Term (50%)**
  - Written (Long Questions, Short Questions, MCQs)

**Text and Reference books:**


**DM 704 Disaster Planning and Management Cr. H. 3**

**COURSE LEARNING OUTCOMES:**
Upon successful completion of the course, the student will be able to:

**UNDERSTAND** the multidisciplinary and multispectral approach in DM. **ILLUSTRATE** the basic elements of planning and plan preparation in DM and role of different stakeholders in DM

**COURSE OUTLINE:**

1. **Introduction**
   a. Disaster Planning and Management
   b. Planning Process
   c. Disaster Management
   d. Significance of Disaster Planning and Management
2. **Disaster Management**
   a. Disaster Management Cycle
   b. Stages in Disaster Management
   c. Modern Challenges in Disaster Management
   d. Key Players in Disaster Management
3. **National Policies and Plans**
   a. National Disaster Management Framework
   b. National Disaster Management Plan
   c. National Disaster Risk reduction Policy
   d. Main Elements of National Policy
   e. Institutional and Legislative Aspects
4. **Coping with Disasters**
   a. Major Requirements for Coping with Disasters
   b. The Basic Philosophy for Coping with Disasters
   c. International Disaster Assistance
   d. Role of Government, Communities, Media, NGOs and Policies
   e. Mainstreaming Hazards Mitigation into Sustainable Development

**Teaching Methodology**

- Lecturing
- Interactive Sessions
- Written Assignments
- Seminar Lectures
- Documentaries

**Assessment**

*Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:*

- **1st Term (20%)**
  - Assignments/Quizzes and Presentations
- **Mid Term (30%)**
  - Written (Long Questions, Short Questions, MCQs)
- **Final Term (50%)**
  - Written (Long Questions, Short Questions, MCQs)

**Text and Reference books:**

DM 705  Emergency Response Management  Cr. H. 3

**COURSE LEARNING OUTCOMES:**
Upon successful completion of the course, the student will be able to:

- Understand the emergency situation, response mechanisms, emergency response management and Guiding Principles of Emergency Planning.

**COURSE OUTLINE:**

1. **Introduction**
   - Emergency management: a basic overview
   - A brief history of emergency management in Pakistan
   - The development and tasks of the emergency management system
   - Characterizing emergency management activities
   - Evaluation of the emergency management system

2. **Determinants of Effective Emergency Management**
   - Understanding Hazard Exposure/Community Vulnerability
   - Situational analysis
   - Resource acquisition
   - Assess Response Requirements and Capabilities
   - Planning Process and planning activities: Horizontal vs Vertical
   - Community Support and Community Resources
   - Establishment of Local Emergency Management Committee

3. **Emergency Management Considerations**
   - Direction and Control
   - Communications
   - Life Safety
   - Property Protection
   - Community Outreach
   - Rehabilitation and Restoration
   - Administration and Logistics
   - Triage

4. **BUILDING AN EFFECTIVE EMERGENCY MANAGEMENT ORGANIZATION**
5. **Guiding Principles of Emergency Planning**
   - Managing Resistance to the Planning Process
   - Adopt a Holistic Approach
   - Promote Multiorganizational Participation
   - Identify Appropriate Actions while Encouraging Improvisation
   - Link Emergency Response to Disaster Recovery and Hazard Mitigation
   - Conduct Thorough Training and Evaluation
   - Adopt a Continuous Planning Process

6. **Roles and Responsibilities of Major Stakeholders in Emergency Response Management in Pakistan**
   - Federal Agencies
   - Provisional Agencies
   - District Agencies
   - United Nations and INGOs
   - Community, Individuals and Volunteers

7. **Post Disaster Needs Assessment**
   - Rapid Need Assessment (Tools, Techniques and Methods)
   - Damage Need Assessment (Tools, procedures and guidelines)

**TEACHING METHODOLOGY**

- Lecturing
- Written Assignments
- Interactive Sessions
- Seminar Lectures
- Audio-Visuals
- Field Visit to Rescue 1122, NEOC, PEOC and Joint Simulations on Response Management

**ASSESSMENT CRITERIA:**
**First Term (20%):** Assignment, Quizzes, Group Activities, Simulations, Field Visit and Presentation
**Mid Term (30%):** Written Test (Long Questions, Short Questions and MCQs)
**Final term (50%):** Written Test (Long Questions, Short Questions and MCQs)
**RECOMMENDED BOOKS:**


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**Course Learning Outcomes:**

Upon Successful completion of this course, the student will be able to:

- **Understand** the students about the interdependence of development measures and the natural hazards and disasters.
- **Explore** the necessity of the integration of disaster risk reduction into the development projects

**COURSE CONTENTS:**

- **Introduction**
  - Forging the links between disasters and development
  - NDMA Act 2010
  - The dilemma of sustainability
  - The Concept & Historical Perspective of Sustainable Development

- **Measures for Sustainable Development**
  - Medium Term Development Framework
  - The Conceptual Relationship between Disasters and Development
  - Disasters – A challenge for developing countries and development cooperation

- **Risk Factors in Development**
  - Global Risk Factors
  - The Disaster Risk Index
  - Risk Patterns at the National and Local Level
  - The Millennium Development Goals
  - Disaster Risk Reduction; An Instrument for Achieving Millennium Development Goals

- **Disaster and National Development**
  - Assessing the trade-offs in investing in vulnerability reduction
  - National Developmental Plans/ Legislation of Pakistan
  - Case studies
### Teaching Methodology

- Lecturing
- Written Assignments
- Interactive Sessions

### Assessment

Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1. **1st Term (20%)**
   - Assignments/Quizzes and Presentations
2. **Mid Term (30%)**
   - Written (Long Questions, Short Questions, MCQs)
3. **Final Term (50%)**
   - Written (Long Questions, Short Questions, MCQs)

### Text and Reference books:


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**DM 707  Natural Hazards of Pakistan  Cr. H. 3**

**COURSE LEARNING OUTCOMES:**

To familiarize with the physiographic personality of Pakistan:

**Understand** the nature, causes, consequences and remedies of the natural hazards occurring in Pakistan.

**COURSE CONTENTS:**

1. Introduction
2. Types and classification of hazards
- Introduction, Classification, Types, Causes, Estimation and Mitigation of Major Natural Hazards of Pakistan:
  - Floods
  - Earthquakes
  - Tsunami
  - Landslides
  - Desertification
  - Drought
  - Cyclone
  - Snow Avalanches
  - Glacial Lakes Outburst Floods (GLOFs)
  - Salinization
  - Heat and Cold Waves
  - Sea Water Intrusion

3. Hazards, Trends and Management
- Future Natural Hazards Trends in Pakistan
- Hazard Management Policies in Pakistan
- Structure for Disaster Risk Management in Pakistan
- Roles and responsibilities of key stakeholders for Disaster Risk Management in Pakistan

4. Case studies
- Case studies from some selected Natural Hazard prone areas of Pakistan

Teaching Methodology
- Lecturing
- Written Assignments
- Interactive Sessions

Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Recommended Books:
1. Atta-Ur- Rahman, Amir Nawaz Khan, Rajib Shaw. 2015. Disaster Risk Reduction
Approaches in Pakistan. Springer

**DM 708  Community Based Disaster Risk Management  Cr. H. 3**

**COURSE LEARNING OUTCOMES:**
Upon successful completion of the course, the student will be able to:
- **Understand** various participatory approaches and strategies and their application in Disaster Management.

**COURSE OUTLINE:**

1. **Introduction**
   - Community and Society
   - Evaluation of Social structure and social organization
   - Myths and Realities in Disaster Situations
   - Concept of Community Based Disaster Risk Management

2. **SOCIAL CAPITAL AND PARTICIPATION THEORY**
   - Evolution of Social Capital Theory
   - Types, Determinants, Dimensions and Levels of Social Capital
   - Evolution of Participation Theory
   - Application and Misuse of Participation
   - Typologies of participation
   - Socio-Cultural and Gender Issues in Participation

3. **Participatory Disaster Risk Management Planning**
   - Rapport Building and Understanding the Community
   - Participatory Community Risk Assessment
   - Risk Management Planning through local stakeholders
   - Participatory Implementation
   - Participatory Monitoring and Evaluation

4. **Disaster Risk Communication at Community Level/ Awareness in DRR**
   - Framework for Disaster Risk Communication
• Importance of Risk Communication
• Objectives of Risk Communication
• Risk Communication: Some Considerations
• Risk Communication: a Systematic Planning Approach
• Target Groups in Risk Communication
• Communicating Disaster Risks: Avoiding Myths
• Sources of Risk Messages
• Risk Communication Messages

5. National and International Policy Documents and CBDRM
• HFA, Sendai Framework and SDGs
• NDMAct-2010, National DRR Policy-2013
• National Disaster Management Plan 2012-22
• Role of CBOs and NGOs

TEACHING METHODOLOGY
• Lecturing
• Written Assignments
• Interactive Sessions
• Group Activities
• Audio-Visuals

ASSESSMENT CRITERIA:
First Term (20 %): Assignment, Quizzes, Group Activities and Presentation
Mid Term (30%): Written Test (Long Questions, Short Questions and MCQs)
Final term (50%): Written Test (Long Questions, Short Questions and MCQs)

RECOMMENDED BOOKS:
COURSE LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:

EXPLAIN the importance of planned efficiency and effectiveness for disaster response and recovery
APPLY the principles of emergency management to multiple disaster types and settings, including both natural and man-made disasters.
PROPOSE a methodology for systematic planning of community wide recovery after disaster

COURSE CONTENT:

1. Introduction
   a. Overview of Response to Disasters
   b. Disaster Response Planning
   c. Disaster Response Roles and Responsibilities
   d. Overview of the Project Cycle

2. Emergency Management
   a. Initial Emergency Operations
   b. Emergency Operations Management
   c. Emergency Operations by Sectors

3. Response Planning
   a. Co-ordination of Planning and Planning for Co-ordination
   b. Developing and Documenting the Plan
   c. Monitoring and Evaluation
   d. Reporting of projects

4. Disaster Recovery
   a. Recovery Issues and Remedies
   b. Damage Need Assessment (DNA), Post Conflict Need Assessment (PCNA)
   c. Camp Coordination and Management
   d. Supply Chain and Warehouse Management
   e. SPHERE standards
   f. UN Cluster System and International Appeal Process

5. Case Studies in International and National Context

Teaching Methodology
   • Lecturing
   • Interactive Sessions
   • Written Assignments
   • Seminar Lectures
   • Documentaries

Assessment
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1st Term (20%)
   • Assignments/Quizzes and Presentations
Mid Term (30%)
   • Written (Long Questions, Short Questions, MCQs)
Final Term (50%)
Text and Reference books:

2. ASIAN Disaster Reduction Center, Kobe, Japan, Total Disaster Risk Management (Good Practices), 2005.
Course Learning Outcomes:
Upon Successful completion of this course, the student will be able to:

- Understand concepts and methodologies for disaster preparedness and response.
- Suggest workable plans for Risk Reduction

COURSE CONTENTS:

- Conceptual and Methodological Issues
  - Types of Disasters
  - Disaster management stages
  - Time Scale (pre, during and post disaster scenario)
  - Disaster Classification
  - Vulnerabilities, Impact and scale of damage
  - Coping Capacities Mechanism
  - Classification of damages and effects
  - Social, infrastructure, economic, environmental and overall effects of damages

- Databases and Disaster Information
  - Types and sources of disaster related information
  - Development of appropriate databases from community level to the national level
  - Database coordination, sharing and communication over time and space

- Disaster Preparedness
  - Situation Analysis (Risks, vulnerabilities & capacities)
  - Response Mechanism (existing and required)
  - Preventive measures / methodologies
  - Preparedness Planning (Need for preparedness planning, Planning processes and elements)
  - Mitigation Measures
  - Coordination
  - Resource Mobilization
  - Information Management
  - Early Warning System (existing and required)
  - Public Education, Training and Rehearsals

- Social and Economic Impact Assessment of Disasters
  - Impact assessment framework/process
  - Tools and techniques

- Contingency Planning and its Process
  - Hazard and risk analysis, contingency prioritization
  - Scenario building
  - Preparing a contingency plan for each selected scenario
  - Rescue, relief, and evacuation planning
Monitoring and updating the contingencies plan

- **Integrating Disaster Preparedness with Development**
  - Integrating Disaster Preparedness with Development
  - Mainstreaming DRR into Development
  - Structural Measures (Disaster shelters, Emergency housing, evacuation shelters, Retrofitting, etc.)
  - Non-Structural Measures
  - Legislations and Reforms (Building Code etc.)
  - Institutional Strengthening

- **Building Safer and Resilient Communities**
  - Risks and Needs of the communities:
  - Prone to natural disasters
  - Post disaster communities

**Teaching Methodology**

- Lecturing
- Written Assignments
- Interactive Sessions

**Assessment**

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1. **1st Term (20%)**
   - Assignments/Quizzes and Presentations

2. **Mid Term (30%)**
   - Written (Long Questions, Short Questions, MCQs)

3. **Final Term (50%)**
   - Written (Long Questions, Short Questions, MCQs)

**Text and Reference books:**

1. ASIAN Disaster Reduction Center, Kobe, Japan, Total Disaster Risk Management (Good Practices), 2005.
2. Economic Commission for Latin America and the Caribbean (ECLAC), 2003.
Course learning outcome:
Upon successful completion of this course, the student will be able to:

- Understand the principles and practices in GIS and RS technology
- Apply various tools to manage pre and post Disaster DRR

Course Contents:

1. Concepts of Remote Sensing

- Historical evolution of GIS and Remote Sensing technology,
- Types of Remote Sensing,
- Electromagnetic spectrum, Interactions with the Atmosphere,
- Principle of Remote Sensing and Aerial photogrammetry
- Spectral Responses at various targets
- Scanners, Sensors

2. Data Sources, Types & Processing

- Data Sources (Analogue & Digital Data)
- Maps, satellite Images, GPS data
- Types of data sources in GIS
- Data collection and Integration
- Data models in GIS
- Datum, Projection and Coordinate System
- Data Resolution and Types of resolution

3. Image Classification, Processing /Enhancement and Lab work

- Principals of Image Classification
- Interpretation of elements
- Digital image processing (DIP)
- Image Interpretation/analysis
- Contrast Manipulation (level slicing, contrast stretching)
- Spatial Feature Manipulation (Spatial filtering, edge enhancement)
- Multi-image manipulations (band rationing and differencing, NDVI, HIS color space transformations)
- Unsupervised Classification
- Supervised Classification, Hybrid
• Signature selection, Supervised, unsupervised and hybrid classification,

Lab Work

➢ Geo-referencing
➢ Creation of feature class
➢ Data input and processing
➢ Data Mosaicing
➢ Thematic Maps and their cartographic representation
➢ Data handling and Output
➢ Use of remotely sensed data
➢ Image processing and extraction of features
➢ Hazard, vulnerability and risk mapping

Teaching Methodology

• Lecturing
• Written Assignments
• Interactive Sessions

Assessment

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1st Term (20%)
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Mid Term (30%)
• Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
• Written (Long Questions, Short Questions, MCQs)

Recommended Books:
COURSE LEARNING OUTCOMES

Upon successful completion of the course, the student will be able to:

- **Understand** basics of statistics, data type, variable types and their level of measurement
- **Understand** statistical methods and techniques that are widely applied in social sciences and their application using SPSS environment
- **Choose** and **perform** a suitable statistical analysis in their research work

COURSE OUTLINE:

1. **Introduction to Statistics**
   - Sample and Population
   - Statistic and parameter
   - Types of variables and their level of measurement
   - Measure of central tendency
   - Measure of dispersion

2. **The SPSS Environment and Lab work**
   - The Data Editor
   - Creating variables
   - Entering data
   - The output viewer
   - Saving and retrieving files

3. **Exploring Data in SPSS and Lab work**
   - Graphing and screening data
   - Exploring groups of data
   - Tests for normality of data

4. **Bi-variant Correlation**
   - Correlation concepts
   - How to measure relationship
   - Graphing relationship
   - Bivariate correlation
   - Using R-square for interpretation
   - Partial correlation
   - How to report results

5. **Regression Analysis**
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<th>Chapter</th>
<th>Topics</th>
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<td>6</td>
<td>Logistic Regression</td>
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<td></td>
<td>- Background to logistic regression</td>
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<td>- Methods of logistic regression</td>
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<td>- Logistic regression in SPSS</td>
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<td>- Interpreting the results</td>
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<td>- Reporting the results</td>
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<td>Comparing two Mean and Lab work</td>
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<td>- Testing difference between means: t-test</td>
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<td>- The dependent t-test</td>
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<td>- The independent t-test</td>
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<td>Comparing Several Means: ANNOVA and Lab work</td>
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<td>- The theory behind ANNOVA</td>
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<td>- One-way ANNOVA in SPSS</td>
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<td>- Post hoc tests in SPSS</td>
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<td>- Interpreting the results</td>
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<td>- Reporting the results</td>
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<td>Multivariate Analysis and Lab work</td>
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<td>- Factor Analysis</td>
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<td>- Discovering factors</td>
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<td>- Factor analysis vs Principal Component Analysis</td>
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<td>- Factor analysis in SPSS</td>
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<td>- Factor scores</td>
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<td>- Interpreting and reporting the results</td>
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<td>- Reliability analysis in SPSS</td>
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<td>- Measures of reliability</td>
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<td>- Cronbach’s alpha</td>
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<td>10</td>
<td>Categorical data and Lab work</td>
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<td>- Theory of analyzing categorical data</td>
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<td>- Pearson’s chi-square test</td>
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<td>- Running chi-square on SPSS</td>
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<td>- Interpreting and reporting results</td>
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Teaching Methodology
- Lecturing
- Assignments

Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Recommended Books:

DM 713 Climate Change Adaptation and Disaster Risk Reduction Cr. H. 2+1

Course Learning Outcomes:
Upon Successful completion of this course, the student will be able to:
- Understand the relationship between climate change adaptations and disaster mitigations.
- Explore the activities of all stakeholders working for climate change adaptation and disaster management in Pakistan

COURSE CONTENTS:
- Introduction
  - Climate change adaptations
  - Disaster mitigations
  - Climate models and international protocols
- Natural Disaster Mitigations
  - Floods and its mitigation.
  - Desertification and its mitigation.
  - Drought and its mitigation.
  - Landslide and its mitigation.
  - Glaciers outburst and associated hazards management.
- Water Management and Lab work
  - Government and public sector stakeholders.
  - NGOs and community participation
  - Fluvial morphology
• Flood and Drought Resilience
• Hydrological modelling
• **Practical: Linking Adaptations and Mitigation and Lab work**
  • Uses and application of climate models
  • Forecasting and Early warning system
  • Multi-hazard forecasting and early warning mechanism in Pakistan
  • RADAR and Satellite based weather forecast
  • Mainstreaming climate change adaptation and disaster mitigation
  • Tools for Climate Change Adaptation

**Teaching Methodology**

• Lecturing
• Written Assignments
• Interactive Sessions
• Guest Speakers
• Visits of Met office

**Assessment**

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1. **1st Term (20%)**
   - Assignments/Quizzes and Presentations

2. **Mid Term (30%)**
   - Written (Long Questions, Short Questions, MCQs)

3. **Final Term (50%)**
   - Written (Long Questions, Short Questions, MCQs)

**Recommended books:**


**OTHER MAJOR/ CORE COURSES**

**DM 721**

**Application of Geo-informatics in Disaster Management**

Cr. H. 2+1
Course Learning outcomes:
Upon Successful completion of this course, the student will be able to:

- **Understand** the uses and application of GIS & RS technology in the field of Disaster Management
- **Apply** GIS & RS technology in the field of Disaster Management

This course would help the students to understand.

Course Contents:
1. **introduction**
   - Lithosphere, Atmosphere, Ionization, Ionic Sphere, Coupling Model, and its application in earthquake precursors,
   - Characteristics of Satellite Images,
     - Interpretation of satellite images,
     - identification and demarcation of important features,
     - Mapping from Satellite Images,
2. **Application of GIS/RS**
   - Application of GIS and RS in Disasters Forecasting and Management,
   - Navigation System
   - Identification of hazard prone areas
   - Uses and applications of multi-spectral, spatial, temporal remote sensing in flood risk management
3. **GIS based mapping**
   - Hazard mapping,
   - Vulnerability mapping,
   - Risk mapping,
   - Landslide susceptibility mapping,
   - seismic hazard mapping
4. **Case studies**
   - Comparative GIS based disaster related Case Studies,
   - Practical Exercises on creating various disasters maps using GIS software such as Arc GIS/ERDAS/MAP INFO/ILWIS.

Teaching Methodology

- Lecturing
- Written Assignments
- Interactive Sessions
- Guest Speakers
- Visits of Met office

Assessment

Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

- 1st Term (20%)
  - Assignments/Quizzes and Presentations
- Mid Term (30%)
  - Written (Long Questions, Short Questions, MCQs)
- Final Term (50%)
DM 722
Climate Change and Disasters  Cr. H. 3

Course Learning Outcomes:
Upon Successful completion of this course, the student will be able to:
- **Understand** the Man and environment interaction.
- **Interlink** the disasters and climate change.
- **Understand** the climate change at global, regional and local levels

COURSE CONTENTS:

- Introduction
- Concept of Climate Change and Disasters
- Weather and Climate
- Elements of Weather and Climate
- **Global Climate**
  - Global Climatic Regions
  - Role of Oceans
    - Surface current, El-Nino and La-lina Effect
    - Carbon Cycle
  - Earth Heat Budget System
  - Hydro-meteorological System
- **Causes of Climate Change**
  - Natural
  - Anthropogenic
- **Green House Effect**
  - Global Warming
  - Extreme Weather Events
  - Extreme Hydro-meteorological Events
- **Hydro-meteorology Disasters**
  - Global Distribution of Hydro-meteorological Disasters

Recommended Books
• Impacts of Climate Change
  • Climate Change and Vulnerabilities
  • Climate Change Mitigation
  • Climate Change Adaptations

Teaching Methodology

• Lecturing
• Written Assignments
• Interactive Sessions
• Guest Speakers
• Visits of Met office

Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
• Assignments/Quizzes and Presentations

Mid Term (30%)
• Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
• Written (Long Questions, Short Questions, MCQs)

Text and Reference books:

- **Evaluate** desertification and coping strategies

**COURSE CONTENT:**

1. **Introduction**
   - The Concept of Desertification
   - Causes and Consequences

2. **Desertification Processes**
   - Occurrence and Distributions
   - Man and Environment Relation
   - Overuse of Resources
   - Deforestation and Desertification

4. **Mitigation Measures for Desertification**
   - Impacts of Desertification on Agro-based Economy
   - Mitigation Measures for Desertification

5. **Role of Institutions and Desertification**
   - Institutions, NGOs,
   - Community Role in Mitigation

6. **Case Studies**
   - Arid and Waterlogged Regions of Pakistan
   - World Drought Regions

**Teaching Methodology**

- Lecturing
- Written Assignments
- Interactive Sessions
- Guest Speakers
- Visits of Met office

**Assessment**

*Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:*

1. **1st Term (20%)**
   - Assignments/Quizzes and Presentations

2. **Mid Term (30%)**
   - Written (Long Questions, Short Questions, MCQs)

3. **Final Term (50%)**
   - Written (Long Questions, Short Questions, MCQs)

**Recommended Books:**


3. JAIN, J. K. (1986) Combating Desertification in Developing Countries. UN Conference on Desertification, Scientific Publishers,
4. MARINI, Alberto; Talbi, Mohamed (2009) Desertification and Risk Analysis Using High and Medium Resolution Satellite Data. Springer,
COURSE LEARNING OUTCOMES:
Upon Successful completion of this course, the student will be able to:

- **Understand** various issues created by disasters and inappropriate disaster management in developing and emerging economies like Pakistan.
- **Analyse** financial allocation made for disaster management and actual economic costs of natural hazards and disasters in Pakistan

Course Content:

1. Introduction
   - Economic Resilience to Natural and Man-made disasters
   - Disaster Management in the economic perspective of governance
   - Resource allocations to DRR and its critical evaluation

2. Impact of disasters
   - Impacts of disasters on Balance of Trade of Pakistan
   - Impacts of disasters on economic growth of Pakistan

3. Disaster and Economic policies and plan
   - Mainstreaming of Disaster Management into Economic Polices of Pakistan
   - Economic costs of disasters to Pakistan’s economy
   - National Developmental Plans
   - Role of Development Finance in Disaster Management
   - Process of financing development in Pakistan

4. Economy and Development
   - Poverty eradication and sustainable livelihoods
   - Demand and Supply of Development Finance
   - Poverty Alleviation and Sustainable Livelihoods

Teaching Methodology

- Lecturing
- Written Assignments
- Interactive Sessions
- Guest Speakers
- Visits of Met office

Assessment

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1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)
Recommended Books:

DM 725 Disaster Management Policies Cr. H. 3

COURSE LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:

Understand national DM framework and legislations with respect to international context. Analyze national DM policies for correct application into mainstreaming for sustainable development.

COURSE CONTENTS:

1. Introduction
   • Evolution of national framework
   • National DM framework with respect to the hazards, vulnerabilities, dynamic pressures and disaster risks
   • International DRR policies like Yokohama Strategy, The Geneva Mandate, Kyoto Protocol, Hyogo Framework for Action (HFA) and Sendai Framework for DRR etc and national aspirations
   • Challenges and opportunities in national and international DRM and DRR frameworks

2. DRR and DRM Structure
   • National Platforms for DRR. Their definition, objectives, principles, composition and major functions.
   • National organizations working on disaster management and responsibilities of key stakeholders.
   • International and Regional DRR structure and its linkages with national platforms.

   • National
   • Regional
   • International
4. **DRM Legislative Framework**
   - Civil Defence Act - 1952
   - The National Calamities Act - 1958 (West Pakistan Calamities Act)
   - Local Government Ordinance - 2001
   - Emergency Services Ordinance - 2002
   - National Disaster Management Ordinance – 2006
   - Disaster Management Act - 2010
   - ERRA Act - 2011

5. **Policy Formulation**
   - Guiding principles
   - DRM priorities
   - Processes
   - Implementation strategies and techniques

6. **Policy Analysis**
   - Concept review
   - Application modalities
   - Implementation strategies
   - Policy writing

**Teaching Methodology**

- Lecturing
- Written Assignments
- Interactive Sessions
- Guest Speakers
- Visits of Met office

**Assessment**

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**1st Term (20%)**
- Assignments/Quizzes and Presentations

**Mid Term (30%)**
- Written (Long Questions, Short Questions, MCQs)

**Final Term (50%)**
- Written (Long Questions, Short Questions, MCQs)
Recommended Books:


DM 726 Disaster Risk and Vulnerabilities Assessment Cr. H. 2+1

Course Learning outcome:
Upon successful completion of the course, the student will be able to:

- Understand different disaster risk and vulnerabilities assessment
- Apply various approaches in carrying out vulnerability and risk assessments

Course Contents:

1. Risk identification
   - Understanding of Risk and Hazards
   - Element at Risk and vulnerabilities
   - Types of vulnerabilities (social, political, economic and geographical)
   - Scale of vulnerabilities (local, regional and national level)

2. Risk perception
   - Theories of Risk Perception
   - Underlying factors for Risk Perception
   - Biases of Risk Perception

3. Types, magnitude and frequency relationship
   - Risk and uncertainty
   - Certainty and probability
   - Hazard prediction - trend projection
   - Hazard prediction - magnitude/frequency analysis
   - Catastrophes

4. Vulnerability and Capacity Assessment (VCA)
   - VCA : Concepts and Definition
   - Purpose of VCA
   - Process of VCA
   - Outcome of a VCA
   - Community Based VCA
   - Disasters, vulnerability and Capacity assessment techniques
5. **Formulation of Spatial Data in Lab**
   - Spatial data quality, decision making and policy analysis
   - The need for spatial metadata
   - Deriving data quality information in GIS
   - Positional accuracy
   - Completeness and logical consistency
   - Attribute accuracy
   - Storing and displaying spatial metadata

6. **Spatial Analysis for Hazard/ Risk mapping in Lab**
   - Hazard Mapping and Risk Assessment
   - Elements of Hazard Mapping
   - Approaches & Methodologies: Qualitative and Quantitative Risk Mapping
   - Elements of Hazard Mapping
   - Data Requirements & Availability
   - Data Standardization
   - Target User
   - Scale
   - Cost and Accuracy
   - Types of Hazard Mapping
   - Flood
   - Landslide
   - Seismic

7. **Field survey: Community Hazard Mapping**
   - Need for Community Hazard Mapping
   - Process/ Methodologies
   - Community Threat
   - Scientific Information

**Teaching Methodology**

- Lecturing
- Written Assignments
- Interactive Sessions
- Guest Speakers
- Visits of Met office

**Assessment**

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- **1st Term (20%)**
  - Assignments/Quizzes and Presentations

- **Mid Term (30%)**
  - Written (Long Questions, Short Questions, MCQs)

- **Final Term (50%)**
  - Written (Long Questions, Short Questions, MCQs)

**Recommended Books:**
DM 727  Disaster Risk Financing  Cr. H. 3

Course Learning outcome:
Upon successful completion of the course, the student will be able to:

- Understand the tools and techniques used for disaster risk financing.
- Gain hands on knowledge of disaster risk financing.

Course Contents:
1. Introduction
   - Significance of Disaster Risk Financing
   - Inter-regional disaster risk financing mechanisms
   - Fiscal disaster risk financing
   - mechanisms at the country level

2. Role of public and private partnership
   - The role of public-private partnerships in disaster insurance
   - Cost – Benefit Analysis of Disaster Risk Financing

7. Risk Transfer
   - Risk Transfer and Finance
   - Risk Financing Instruments
   - Micro Credit in DRR
   - The role of private disaster insurance in disaster risk financing

8. Risk Financing in Pakistan
   - Financial Arrangement for Disaster Management in Pakistan
     - Prime Minister’s Disaster Relief Fund
     - Risk Mitigation Fund
     - Drought Emergency Relief Assistance

Teaching Methodology

- Lecturing
- Written Assignments
- Interactive Sessions
Guest Speakers
Visits of Met office

Assessment
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1. 1st Term (20%)
   - Assignments/Quizzes and Presentations

2. Mid Term (30%)
   - Written (Long Questions, Short Questions, MCQs)

3. Final Term (50%)
   - Written (Long Questions, Short Questions, MCQs)

Recommended Books:

DM 728  Disasters Risks and Urbanization  Cr. H. 3

Course Learning Objectives:
After successful completion of the course, the students will be able to:
Understand the process of urbanization, its causes and impacts
Analyze urban disasters especially within urban slums and squatter settlement
Apply urban growth management strategies to cope with the urban disaster risks

Course Contents:
Introduction
- Introduction to Disasters Risk and Urbanization and their relationship

Urbanization
- Understanding of city functions and forms
- Population distribution in city and social classes
- Pattern of Urbanization in Developed and Developing Countries
- Urbanization (Definition, Causes, Impacts)
- Problems of Urbanization

Disaster Risks in Urban Environment
- Hazards in urban environment.
Fire, Chemical Hazards, nuclear, epidemics, flood, earthquake, windstorm, hailstorm etc.
- Vulnerabilities in urban areas.
- Population distribution, housing structure, building codes, accessibility conditions, emergency services etc.
- Geology, hydrology, drainage, soil etc.

**Urban Risk Assessments**
- Hazard, Exposure and Vulnerabilities, and Capacity assessment in urban areas.
- Risk Reduction Measures.
- Improvement of civic services, urban growth and management
- Emergency response management.

**Teaching Methodologies:**
- Lectures and case studies
- Documentaries and visuals
- Interactive discussions and talks
- Assignments and quizzes

**Assessment**
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**1st Term (20%)**
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**Mid Term (30%)**
- Written (Long Questions, Short Questions, MCQs)

**Final Term (50%)**
- Written (Long Questions, Short Questions, MCQs)

**Recommended Books:**


DM 729  Management of Drought Hazard  Cr. H. 3

COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

- **Understand** the nature, causes, consequences and remedies of the drought hazard.

COURSE OUTLINE:

1. **Introduction and Overview**
   - Hydrologic cycle and processes
   - Hydrologic measurements
   - Extreme hydro-met events
   - Drought as Natural hazard
   - Types and Classification of Drought
   - Standardised Precipitation Index
   - Standardised Evapo-transpiration index
   - Drought and Koppen climate classification

2. **Hydrology of Droughts**
   - Estimation techniques (unit hydrograph, statistical analysis)
   - Drought types and severity
   - Hydrologic and hydraulic models
   - Fluvial morphology

3. **Forecasting and Warning System**
   - Overview of forecasting models
   - Tools and techniques for drought forecasting
   - Weather RADARS and Satellite based approaches
   - Drought Warning and adaptations
   - Warning procedure and dissemination

4. **Impacts and Assessment**
   - Impacts: physical, socio-economic and environmental
   - Drought Assessment tools and techniques
   - Drought assessment indices
   - Vulnerability and capacity assessment
   - Stakeholder participation
5. **Droughts and Mitigation**
   - Mitigation and Adaptation Measures
   - Drought Damages
   - Drought Management
   - Institutional Arrangement
   - Collaboration and Coordination

6. **Risk Management**
   - Framework of risk management
   - Risk decision-making principles
   - Risk assessment methods
   - Prevention, preparedness and mitigation
   - Tools, strategies and organizational arrangements

7. **Case Studies from Pakistan and around the Globe**

**Teaching Methodology**
- Lecturing
- Written Assignments
- Documentaries

**Assessment**

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1st Term (20%)
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Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

**Recommended Books:**


### COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

- **Understand** the nature, causes and consequences of the earthquake hazards
- **Apply** the knowledge and tools for earthquake hazards assessment and risk mitigation

### Course outline:

6. **Introduction**
   - Basics on Earthquakes (Plate Tectonics, Faults, Size and Location of Earthquakes)
   - Seismology, Seismic Waves and Seismometry
   - Introduction to national/international Seismic Monitoring Stations and Networks

7. **Seismic Hazards and Lab work**
   - Primary, Secondary and Tertiary Hazards (Ground Shaking, Land-Sliding, Liquefaction, Tsunami, Fires, etc.)
   - Strong Ground Motions Parameters and Characterization
   - Attenuation Relationships/Ground Motions Prediction Equations (GMPEs) and Applications
   - Seismic Hazard Analysis (Deterministic & Probabilistic Seismic Hazard Analysis)
   - Case Studies: DSHA and PSHA
   - Local site-effects, geotechnical investigations and seismic soil-response analysis (Deep Soil, )
   - Evaluation of Landsliding and Liquefaction Hazards
   - Seismic Micro-Zonation and Zoning

8. **Seismic Risk and Lab work**
   - Exposure Characterization
   - Field Visits (understand Urban Building Typologies)
   - Seismic Vulnerability/Fragility Assessment (Empirical, Experimental, Analytical)
   - Seismic Hazard Assessment Procedures (CRISIS/EZ-FRISK, OpenSHA)
   - Vulnerability of lifeline Structures (Transportation, Bridges, Dams, Electrical Communication, etc.)
   - Introduction to Earthquake Loss Estimation Tools/Methods/Procedures (EMS-98, RADIUS, GEM, etc.)
   - Seismic Risk Assessment Case Studies: Damage Assessment and Loss Estimation

9. **Seismic Risk Mitigation and Lab based exercises**
   - Traditional and Vernacular Constructions as Earthquake-Resistant
   - Building Codes and Standards/Guidelines for Earthquake-Resistant Constructions
   - Field survey and building codes applications
   - Design and Drawing of Seismic resilient structures
   - Advanced Risk Mitigation Techniques (Strengthening/Retrofitting, Isolation, Seismic Energy Dissipation Devices)
f. Earthquake Prediction and Early Warning Systems  
g. Earthquake Insurance Modelling

Teaching Methodology

- Lecturing  
- Written Assignments  
- Case Studies  
- Mini Projects  
- Softwares Application

Assessment

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1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Text and Reference books:

8. EZ-FRISK. Seismic hazard analysis.
10. DeepSoil. 1D Equivalent Linear and Nonlinear Site Response Analysis. UIUC, USA.
15. GEM: Open Tools for Earthquake Loss Modelling. Pavia, Italy.
COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

**Understand** the positive role of economics in achieving disaster risk reduction

**Apply** tools and techniques for the proper assessment of disaster damages

Course Contents:

**Introduction**
- Understanding the economic and financial impacts of disasters
- Economic Impacts of Disasters in Pakistan
- Nature of Economic Aid after Disasters

**Level of Economic impacts**
- Macro-economic impacts of disaster
- Micro-economic Impacts of Disasters

**Risk sharing and financing**
- Insurance Against Disaster Losses
- Financial and economic tools
- Effects of Disasters on Capital Accumulation
- Economic Resilience to Disasters
- Public Finance and Disasters

**Cost of Disasters**
- Economic cost of Disasters
- Cost – Benefit Analysis of DRR
- Financing the Cost of Future Disasters
- Significance of Insurance in risk reduction across developing countries
- Making Disaster Risk Reduction and Insurance Work Together.

Teaching Methodology

- Lecturing
- Written Assignments
- Case Studies
- Mini Projects
- Softwares Application

Assessment

Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)
Recommended Books:

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
1. Understand the entire EIA / IEE processes for minimising occurrences of natural vs man-made disasters associated with new development schemes
2. Apply EIA techniques for impacts analysis of development projects in different sectors

Course Contents:
1. Introduction
   - Introduction to Basic Concepts in Environment and its Main Components
   - Interdependence / Interrelationship between the Environment and Development, Environment as Repository of Resources for Development, Development' Influence on the Environment
   - IEE / EIA Concepts and its Rationale for New Development Projects / Programs
2. Environmental Legislations in Pakistan
   - Environmental Legislations (Pakistan Environmental Protection Ordinance 1983, Pakistan Environmental Protection Act 1997),
   - Main Features and Legislative Provisions for IEE / EIA
   - IEE / EIA Regulations 2000, Public Participation and Post Auditing / Monitoring under the Regulations
3. EIA / IEE Process and methodologies
   - Overview of EIA Processes and its Relation / Integration at the Project Level
   - EIA Methodologies, Concept and their Classification vis a vis Advantages and Disadvantages of Different Methodologies,
   - Categorisation of Development Projects and Impacts Analysis of Sectoral Development Projects
4. Baseline data and mitigation
   - Baseline Data Collection and Impacts Predictions in EIA
   - Mitigation Measures and Development of Environmental Management Plan (EMP)

Teaching Methodology
- Lecturing
- Written Assignments
Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations
Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)
Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Recommended Books:
### Types, Causes and Impact of Floods

- **Types of Floods** (Riverine flood, Flash flood, Coastal flood, GLOF)
- **Causes of Floods**
  - Meteorological
  - Hydrological
  - Anthropogenic
- **Flood Intensifying Conditions**
- **Impacts of flood**

### Flood and Assessment Models and Lab Based Exercises

- Flood Hazard Assessment
- Integrated Flood Risk Management
- Flood Modelling
- Use of HEC-RAS and Geo-RAS

### Flood Management and Field Survey

- Flood and Challenges in Flood management
- Flood dealing line agencies and their responsibilities
- Flood Mitigation Measures
  - Structural (Engineering Protection) and design
  - Non-structural (Forecasting techniques, Planning and Policies)
- Early Warning System for Floods

### Field Survey

- Flood hazard mapping and zonation
- Land use planning and zoning in floodplain

### Recommended Books:


### Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

- **Understand** the causes, consequences and impacts of hydro-meteorological hazards.
- **Apply** the forecasting techniques of hydro-meteorological hazards.

### Course Contents:

**Introduction to course**
- Introduction to the forecasting of hydro-meteorological hazards.
- Atmospheric circulations
- Climatology and Meteorology
- Atmosphere and weather phenomena
- Vertical and horizontal distribution of temperature and pressure.
- Types of clouds and precipitation.
- Measuring instruments.
- Weather phenomenon
- Weather forecast and tools

**Meteorology, Hydrology and Hazards**
- Physiography and climate
- Meteorology and Hydrology
- Types of hydro-meteorological hazards.
- Basic elements of hydro-meteorological hazards (Intensity, density, exposed population and property)

**Forecasting of Hydro-meteorological hazards**
- Measuring and presentation of the hydro-meteorological hazards (Scale, level and end user).
- Use of modern technology in forecasting
- Multi-hazard Forecasting system
- Major stakeholders (Government, public and international institutions).
- Forecasting of hydro-meteorological hazards.
- Early warning system for different hazards.

**Recommended Books:**

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**DM 735**  
**Gender Mainstreaming in Disaster Management**  
**Cr. H. 3**

**COURSE LEARNING OUTCOMES:**

Upon successful completion of the course, the student will be able to:
- Understand the impacts of disaster on women and
- Analyse the contribution of women in disaster management

**COURSE CONTENTS:**

1. Introduction
   - Basic Concepts of gender
   - Difference between Women’s Studies and Gender Studies
   - Gender lens, sex disaggregated data, gender discrimination.
   - Gender sensitivity and gender sensitization.
   - Importance of gender analysis in framing policies, programs and projects
   - Gender equality and equity
• Understanding the concept of gender division of labor

2. Gender Mainstreaming
• Explanation of the concept
• Importance of gender mainstreaming in policies, programmes and projects
• Strategies for gender mainstreaming
• Process of gender mainstreaming in an organization
• Qualities required at individual level for gender mainstreaming policies
• Strategies for successful implementation of gender mainstreaming in an organization

3. Gender and Development
• Effect of development process on women and men
• Women and development
• Approaches to gender and development
• The Welfare Approach
• The WID Approach
• Women and Development Approach (WAD)
• The Efficiency Approach
• The Empowerment Approach
• Gender and Development Approach (GAD)

4. Gender inequality
• Distributive and Relational aspects of gender inequality
• Norms of Patriarchy
• Impact of Modernization
• Impact and influence of supreme powers in the developing countries
• Colonialism, imperialism and development
• Impact of Colonialism and imperialism on women development
• Women in development programmes

5. Gender equality and the Sustainable Development Goals
• The Millennium Development Goals
• Indicators of gender equality
• Gender equality and poverty
• Gender equality and health & nutrition goals
• Gender equality and environment
• Analysis of situation in Pakistan

6. Gender and gender relations in disasters
• Perspective of gender: A missing element in disaster
• Gender inequality, vulnerability and disaster
• Gender Specific Needs and Issues
7. Role of women in disaster management

- Differential impact of disaster on women in different life cycle stages
- Women involvement in reconstruction and development phase following an emergency and/or disaster
- Psychosocial considerations: prevention, mitigation and preparedness
- Community mobilization through women
- Gender Equality and Human Development Outcomes: Enhancing Capabilities
- Case studies of women responding to disaster

TEACHING METHODOLOGY

- Lecturing
- Written Assignments
- Interactive Sessions
- Audio-Visuals
- Seminar Lectures
- Field Visits

ASSESSMENT CRITERIA:
First Term (20%): Assignment, Quizzes, Group Activities and Presentation
Mid Term (30%): Written Test (Long Questions, Short Questions and MCQs)
Final term (50%): Written Test (Long Questions, Short Questions and MCQs)

Recommended Books:
3. BRAWDSHAH, Sarah. (2013). Gender, Development and Disaster. Edward Elgar Cheltenham, United Kingdom
4. ENARSON, Elaine and Chakrabarti, P G Dhar (2009). Women, Gender and Disaster: Global Issues and Initiatives. SAGE Publication Lts California, USA

DM 736  Geomorphology and Natural Hazards  Cr. H. 3

COURSE LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:

- Acquire the knowledge about the formation of various landforms on the surface of the earth.
- Understand the geomorphic processes by which various types of structures developed on the earth surface
- Apply the relationship between geomorphic processes and natural hazards

**COURSE CONTENTS:**

- Introduction to Geomorphology (Scope and Importance, Geomorphology and Environment, Geomorphic Change and Man)
- Geomorphological processes and its classification;
- weathering and erosion;
- Glaciers, their erosional and depositional landforms;
- Geological work of wind and associated features;
- Erosional and depositional work of surface and subsurface water;
- Valley and base-level development and its types;
- Drainage pattern, Drought
- Desertification, Causes and its Implications
- Stream meandering and development of flood plains;
- The erosional and depositional work of sea; development of coastal landforms;
- geomorphic cycles and associated landforms produced by tectonics and volcanic activity
- Effect of landslides and volcanoes on geomorphological land forms
- Introduction to topographic maps; aerial photographs and satellite imageries.
- Monitoring of Geomorphological Changes in the Environment
- Techniques of Geomorphological Mapping
- Geomorphology and Environmental Management
- Geomorphology in Disaster Planning and Management

**Teaching Methodology:**

- Lectures
- Field visits
- Assignments
- Documentaries

**Assessment Criteria:**

- Subjective and objective type questions
- Assignments
- Quizzes
- Viva voce

**Recommended Books:**

### Course Learning outcome:
Upon successful completion of the course, the student will be able to:

i. To understand the hazard mapping.

ii. To apply various method and techniques of hazard mapping.

### Course Contents:
- Introduction to Techniques of Hazards Mapping
- Maps (Definition, Importance and Use)
- Types of Maps (Scale, Purpose and Content)
- Basic Elements of a Map
- Map Making Techniques
  - Sketch Map
  - Drawing Tools
  - Surveying Tools
  - Computer Aided Cartography
  - GIS
  - Multi-Tool Mapping
- Types of Hazards
- Global Distribution of Hazards
- Spatial Distribution of a Hazard
- Basic Elements of a Hazards to be Mapped
- Hazard and Scale of a Map (Level of the Representation of a Hazard)
- Limitation of Hazards Mapping
- Drought Hazard Mapping
- Earthquake Hazard Mapping
- Use of GIS for Hazards Mapping
- Hazard zonations

### Recommended Books:
Upon successful completion of the course, the student will be able to:

- **UNDERSTAND** the nature, causes and consequences of land slide.
- **EXPLORE** the remedies for the victims of landslide hazards.

**COURSE CONTENT:**

1. **Introduction**
   - Landslide and Mass-Movement
   - Classification of Landslides
2. **Causes of Land sliding**
   - Factors Responsible for Triggering the Landslides
   - Inventory of the Landslide Hazards
   - Slope Stability and Instability and their Classification
3. **Risk Assessment**
   - Elements at Risk
   - Landslide Risk Assessment
4. **Risk Management**
   - Landslide Hazard Management
   - Community Based Landslide Hazard Management
   - Slope Stabilization
     a. Engineering Methods
     b. Bio-Engineering Methods
     c. Soil Bio-Engineering Methods
   - Preparedness (Community, Institutions, Early Warning System etc.)
5. **Case Studies from Pakistan and rest of the world**

**Teaching Methodology:**

- Lectures
- Field visits
- Assignments
- Documentaries

**ASSESSMENT CRITERIA:**

- **First Term (20 %):** Assignment, Quizzes, Group Activities and Presentation
- **Mid Term (30%):** Written Test (Long Questions, Short Questions and MCQs)
- **Final term (50%):** Written Test (Long Questions, Short Questions and MCQs)

**RECOMMENDED BOOKS:**

**Course Objectives:**
After successful completion of the course, the students will be able to:
- **Understand** the interdependence of disasters and livelihoods.
- **Analyse** the livelihood opportunities and activities within disaster prone areas in Pakistan.
- **Evaluate** the strategies for the adaptation of sustainable livelihood within disaster prone areas.

**Course Contents:**

**Introduction**
- Introduction to Livelihood Assets
- Introduction to Sustainable Livelihood Framework (SLF)

**Sustainable Livelihood and Disasters**
- Vulnerability context of the livelihood framework
- Concept of Interdependence of Disaster Risk Reduction, Vulnerability and Livelihoods
- Disaster Risk Reduction a necessity for Sustainable Development
- Investment in DRR for sustainable livelihoods
- Risk Reduction with sustainable livelihood
- Enhancing resilience through livelihoods
- Supply chains and natural hazards
- Vulnerable livelihoods and risk factors
- Best Practices in Livelihoods

**Teaching Methodologies:**
- Lectures and case studies
- Documentaries and visuals
- Interactive discussions and talks
- Assignments and quizzes

**Assessment**
*Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:*

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

**Recommended Books:**

DM 740 Planning and Management of Disasters in Pakistan Cr. H. 3

COURSE LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:
- **UNDERSTAND** Disaster Planning and Management and Disaster Management Framework of Pakistan.
- **ACQUIRE** knowledge about disaster management structure and the integration of DRR with the development planning.

COURSE CONTENT:

1. **Introduction**
   - Concept of Planning
   - Types of Planning
   - Resources and Core Competencies for Planning

2. **Disaster Planning and Management**
   - History of Disaster Management in Pakistan
   - Significance in Pakistan
   - Disaster Management Cycle as a Planning Tool and guide
   - Guidelines for formulation of DRR Plans in Pakistan
   - Major requirements for coping with disasters (Organization, Planning and Training

3. **Disaster Management Related Legislation in Pakistan**
   - The west Pakistan National Calamities Act 1958
   - Civil Defense Act
   - National fund for cultural Heritage act, 1994
   - Pakistan environmental protection act, 1997:
   - Local government acts
   - Emergency services acts and bills
   - National disaster management act-2010
   - National climate change act-2017
4. Disaster Management Policies of Pakistan
   - National Disaster Management Policies
   - National Climate Change Policies
   - National Environmental Policies

5. Disaster Management Plans
   - International DRR Strategies and Obligations of Pakistan
   - National Level DRR Plan and Strategies
   - Provincial Level DRR Plan and Strategies
   - District Level DRR Plans and Strategies

6. Institutional System for Disaster Management n Pakistan
   - National Level Structure
   - Provincial Level Structure
   - District Level Structure
   - Sub-District level Structure

7. DRR and National Development Plans: Gaps and Challenges
   - Five and Ten Perspective Plans and DRR
   - National Environmental Action Plans and DRR
   - The Pakistan National Conservation Strategy
   - Poverty Reduction Strategy Paper

Recommended Books:
Upon successful completion of the course, the student will be able to:

- **Understand** the psychological impacts of disasters and strategies for management of post-traumatic stress disorders.

**COURSE CONTENT:**

- **Introduction**
  - Mental Health and Psychosocial Issues in Post Disaster Situation
  - Recognizing Normal Psychological Reactions to Disasters
  - Distress vs. Disorder

- **Trauma response**
  - Normal response
  - Basic principle
  - Bio psychosocial model
  - Cultural influences

- **FACTORS INFLUENCING EMOTIONAL REACTIONS TO DISASTERS**
  - Origin of the disaster
  - Degree of personal impact
  - Size and scope of the disaster
  - Probability of recurrence
  - Characteristics of survivors
  - Common disaster-related stress reactions (Emotional reactions, Cognitive reactions, Physical reactions and Interpersonal reactions)

- **Classification of Psychological Disorders**
  - Traumatic grief
  - Depression
  - Anxiety
  - Post-traumatic stress disorder

- **Psychological support**
  - Psychological first aid
  - Coping strategies
  - Resiliency models.

- **Community Mental health programmes**
  - Provision of Recreational Activities
  - Cash for Work Programme
  - Food for Work Programme
  - Cash and Food for Training
  - Child Friendly Spaces

**TEACHING METHODOLOGY**

- Lecturing
- Written Assignments
- Interactive Sessions
- Audio-Visuals
ASSESSMENT CRITERIA:
First Term (20 %): Assignment, Quizzes, Group Activities and Presentation
Mid Term (30%): Written Test (Long Questions, Short Questions and MCQs)
Final term (50%): Written Test (Long Questions, Short Questions and MCQs)

Recommended Books:

DM 742 Sociology of Disasters Cr. H. 3

COURSE LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:
- UNDERSTAND the framework for thinking about disasters in a sociological perspective.
- ACQUIRE knowledge about the impacts of disaster on social system and the vice versa, Social Stratification and disasters, and the role of Social Capital theory in disaster management.

COURSE CONTENT:
1. Introduction
   - Sociology and the Study of Disasters
   - Social System, Ecological Networks and Disaster
   - Role of Ideologies (Faith, Belief and Religion) in Disasters
   - Myths, Realities and Cultural Representation of Disaster
2. Sociological Perspective on Disaster
   - Structural Functionalism
   - Conflict Perspective
   - Symbolic Interactionism Perspective
   - Human Ecology
   - Political Economy
3. Impacts of Disasters on Social System
   - Behavioural Response to Disaster
   - Trauma: Individual, Social and Cultural
   - Disaster and Displacement (Local and International)
   - Impacts on Social Fabric of Society
   - Consequences of Post disaster relocation and prospects for recovery
4. Social Stratification and Disasters
   - Linkages between Social Vulnerability and Inequality
   - Disasters and Social Class (Race, Creed, Caste and Economic groups)
   - Gender Inequality and Disaster
   - Disasters, language barrier and disabilities
   - Disasters as an agent of social change

5. Social Capital and Disaster
   - Definitions, forms, and measurement of social capital
   - Social capital, neoliberalism, and rational choice theory
   - Role of Social Capital in Disaster Management

TEACHING METHODOLOGY

- Lecturing
- Written Assignments
- Interactive Sessions
- Group Activities
- Webinars
- Seminar Lectures
- Audio-Visuals

ASSESSMENT CRITERIA:

Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

First Term (20%): Assignment, Quizzes, Group Activities and Presentation
Mid Term (30%): Written Test (Long Questions, Short Questions and MCQs)
Final Term (50%): Written Test (Long Questions, Short Questions and MCQs)

RECOMMENDED BOOKS:
COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

- **UNDERSTAND** the fundamentals of media and its nexus with DM.
- **ILLUSTRATE** the role of Media in DM in Pakistan with special reference to the importance of media in pre and post-disaster scenarios.

Course outline:

1. **Introduction**
   - Media Studies, definition
   - Historical Sketch of Media Studies
   - Types of Media
2. **Relationship between Media and DM**
   - Media in Disaster Management Cycle (Expand Contract DM Model)
   - Media in Pre-Disaster Stage
   - Media in Post Disaster response
3. **Media in Emergencies**
   - Means of Communications
   - Media in Emergency communications
   - National Institutions/policies and Media (PEMRA)
4. **Impact of Media in Disasters**
   - Positive impacts
   - Negative impacts
   - Code of Conduct
5. **Media role in context of Pakistan**
   - Reactive in nature
   - Post disaster focused
   - Lack of Disaster journalism
   - Policy gap
6. **Way Forward**
   - Revised role of Media in disaster legislations
   - Unbiased journalism
   - Focus on DRR and Resilience
   - Focus on Pre-Disaster Cycle

Teaching Methodology

- Lecturing
- Interactive Sessions
- Written Assignments
- Seminar Lectures
- Documentaries

Assessment

**Note:** Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1. **1st Term (20%)**
   - Assignments/Quizzes and Presentations
### Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

### Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

### Text and Reference books:
5. Government of Pakistan (GoP) PEMRA Ordinance, Islamabad

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**DM 744 Contingency Planning in Disaster Management**

**Cr. H. 3**

### Course Objectives:
After successful completion of the course, the students will be able to:
- **Understand** the role of various agencies related to contingency planning
- **Evaluate** the contingency planning of DM related agencies

### Course Contents:

**Introduction**
- Introduction to contingency Planning
- Preparedness: Organization. Training, Planning and/or Plans
- Contingency Planning and its Process
- Hazard and risk analysis, contingency prioritization
- Scenario building in contingency planning
- Preparing a contingency plan for each selected scenario
- Rescue, relief, and evacuation planning

**Contingency Planning at work**
- Monitoring and updating the contingencies plan. Plan Preparation: Level, Components, Viability, Check list etc.
- Dynamic Nature of Disaster Management
- Contingency Planning - Planning Continuum
- Methodology & Steps
- Content of the contingency Plan
- Time Line
- Likely Actions at Federal, Provincial and District levels
- Monsoon Contingency Plan
- Case Studies (Evaluation of various contingency plans by PDMA and LGUs)

### Recommended Books:
Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:

- **UNDERSTAND** Peace, Conflict, Violence and Terrorism;
- **APPLY** knowledge about achieving peace with justice and post conflict development.

COURSE CONTENTS

INTRODUCTION
- Introduction to Peace and Conflict Studies
- Defining Peace, Conflict and Violence
- History and Politics of War and Peace
- Theories of Violence and Conflict

CONFLICT ANALYSIS AND RESOLUTION
- Human Needs Theory and Conflict Resolution
- Conflict Analysis and Resolution Principles and Methods
- Conflict Resolution Skills and Techniques

TERRORISM AND CONFLICT IN PAKISTAN
- History of terrorism
- Impact on Society (Human, Environmental, Economic and Social)
- Post Conflict Need Assessment
- Post Conflict Recovery
- Case Studies on Conflict Management and Post Conflict Development

ACHIEVING PEACE WITH JUSTICE
- Conflict Transformation, Reconciliation and Peace building
- Human Rights and Peace with Justice
- International Peace and Security
- Nonviolence and Social Movements
- Gender Issues in Conflict and Post-Conflict
Final Reflections, Integration and Evaluations

TEACHING METHODOLOGIES:
- Lectures and case studies
- Documentaries and visuals
- Interactive discussions and talks
- Assignments and quizzes
- Tabletop Exercises

Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
- Assignments/Quizzes and Presentations

Mid Term (30%)
- Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
- Written (Long Questions, Short Questions, MCQs)

Recommended Books:

JEONG, H W (2017) Peace and Conflict Studies, an Introduction, Routledge, USA

COOPER, R & Finley, L (2014) Peace and Conflict Studies Research, Information Age Publication Inc, USA


WILKINSON, R. (2005) “Inequality: more hostile, less sociable societies” in The Impact of Inequality. Routledge, USA
Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

I. **UNDERSTAND** fundamental knowledge of basic concepts and approaches related to Ecosystem based DRR (Eco-DRR) and Ecosystem based Adaptation (EbA)

II. **EXPLAIN** Disaster Risk trends, Disaster Risk Reduction (DRR) gap analysis and linkages to the environment

III. **APPLY** working knowledge about the tools for assessing risks and Eco-DRR/Climate Change Adaptation (CCA)

**Course outline:**

1. **Introduction**
   a. Global data on risk, disasters and ecosystems
   b. Linking CCA and DRR
   c. Modelling Risk, Vulnerability and Sustainable Development
   d. Data and tools for vulnerability assessments

2. **Ecosystem based DRR (Eco-DRR)**
   a. Linking global environmental problems and disasters
   b. Fundamental concepts of ecosystems and ecosystems services
   c. Linking sustainable development, disasters and environment
   d. Major eco-zones, hazards and impact on populations
   e. Ecosystem services for vulnerability reduction
   f. Ecological Engineering for DRR
   g. Valuing ecosystem services

3. **Eco-DRR instruments and approaches**
   a. Introduction to instruments and approaches for Eco-DRR
   b. Spatial planning tools and approaches for DRR
   c. Integrated Water Resources Management/River basin management (IWRM)
   d. Integrated Coastal Zone Management (ICZM)
   e. Managing ecosystems for urban risk reduction
   f. Protected Areas
   g. Ecosystem-based Adaptation (EbA)
   h. Community-based Ecosystem and Disaster Risk Management.

4. **Mainstreaming Environment and DRR in development**
   a. Fundamentals of effective advocacy
   b. Mainstreaming Eco-DRR
   c. Economics of DRR

5. **Case Studies in International and National Context**

**Teaching Methodology**
• Lecturing
• Interactive Sessions
• Written Assignments
• Seminar Lectures
• Documentaries

Assessment
Note: Each university can adopt the assessment of this course as per their approved criteria. However, the committee proposed the following assessment criteria:

1st Term (20%)
• Assignments/Quizzes and Presentations

Mid Term (30%)
• Written (Long Questions, Short Questions, MCQs)

Final Term (50%)
• Written (Long Questions, Short Questions, MCQs)

Text and Reference books:


