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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PREFACE

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).

(Fida Hussain)
Director General (Academics)
CURRICULUM DEVELOPMENT PROCESS

STAGE-I

STAGE-II

STAGE-III

STAGE-IV

CURRI. UNDER CONSIDERATION

CURRI. IN DRAFT STAGE

FINAL STAGE

FOLLOW UP STUDY

COLLECTION OF REC

APPRASIAL OF 1ST DRAFT BY EXP. OF COL./UNIV

PREP. OF FINAL CURRI.

QUESTIONNAIRE

CONS. OF CRC.

FINALIZATION OF DRAFT BY CRC

INCORPORATION OF REC. OF V.C.C.

COMMENTS

PREP. OF DRAFT BY CRC

APPROVAL OF CURRI. BY V.C.C.

PRINTING OF CURRI.

REVIEW

IMPLOF CURRI.

BACK TO STAGE-I

ORIENTATION COURSES

Abbreviations Used:
CRC. Curriculum Revision Committee
VCC. Vice Chancellor's Committee
EXP. Experts
COL. Colleges
UNI. Universities
PREP. Preparation
REC. Recommendations
INTRODUCTION

Final meeting of the National Curriculum Revision Committee (NCRC) on Disaster Management was held at the HEC Regional Centre, Lahore on March 05-07, 2014 to finalized the curricula for BS and MS in Disaster Management. The following subject experts from various universities attended the meeting.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name &amp; Address</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. Dr. Amir Nawaz Khan, Dean, Faculty of Life &amp; Environmental Science, Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar.</td>
<td>Convener</td>
</tr>
<tr>
<td>2</td>
<td>Dr. Amjad Ali, Lecturer, Centre for Disaster Preparedness &amp; Management, University of Peshawar, Peshawar.</td>
<td>Secretary/Member</td>
</tr>
<tr>
<td>3</td>
<td>Prof. Dr. Muhammad Mehboob, Professor, Department of Civil Engg, Mehran University of Engg &amp; Technology, Jamshoro, Sindh.</td>
<td>Member</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Badar Munir Khan Ghauri, Professor, Department of Remote Sensing &amp; Geo-Information Science, Institute of Space Technology, SUPARCO HQs, Off University Road, Gulzar Hijri, Karachi.</td>
<td>Member</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Syed Mohammad Ali, Director / Associate Professor, Department of Earthquake Engineering, Room # 1, Earthquake Engineering Centre, University of Engineering &amp; Technology, Peshawar.</td>
<td>Member</td>
</tr>
<tr>
<td>6</td>
<td>Dr. Ali Iqtadar Mirza, Chairperson, Department of Geography, Government College University, Lahore.</td>
<td>Member</td>
</tr>
<tr>
<td>7</td>
<td>Dr. Mobushir Riaz Khan, Associate Professor, Department of Space Science, Institute of Space Technology, SUPARCO, Islamabad Expressway,</td>
<td>Member</td>
</tr>
</tbody>
</table>
The meeting was started with recitation from the Holy Quran by Mr. Abid Wahab, Assistant Director, Higher Education Commission, Islamabad. After recitation, Prof. Naeem Khalid, Advisor to Higher Education Commission, Curriculum welcomed the participants. The convener of the committee, Prof. Dr. Amir Nawaz Khan, Dean Faculty of Life and Environmental Sciences, University of Peshawar highlighted the importance of curriculum development at national level. Mr. Nazeer Hussain, Director, Higher Education Commission, Lahore gave a quick rundown of the efforts by HEC to promote Higher Education in Pakistan with special reference to the development of curriculum and its accreditation.
The Secretary of the committee, Dr. Amjad Ali, Lecturer, Centre for Disaster Preparedness & Management, University of Peshawar, discussed the progress of last meeting held on September 9-11, 2013. The Convener of the committee and worthy members shows full satisfaction on the progress made in last NCRC meeting. The worthy members thoroughly discussed and finalized the vision, mission, title of the degree, eligibility criteria, and layout of BS & MS in disaster Management. The participants reviewed each course keeping in view the comments of their colleagues at their respective universities. Courses were thoroughly reviewed and modified. New courses were also added in the curriculum of Disaster Management keeping in view the emerging trends.

The committee finalized the curriculum for Under-graduate and Post-graduate levels of Disaster Management. On behalf of HEC, Mr. Abid Wahab, Assistant Director (Curriculum) HEC appreciated the inputs of the participants during the meeting and thanked all the participants. Finally, the meeting was concluded with the vote of thanks by the Chair.

**VISION**
Our vision is to contribute towards national integration and consolidation and help overcome the sense of forlornness and alienation in vulnerable communities.

**MISSION**
Our commitment is to equip human beings with the knowledge and skills to minimize the damages and miseries of disasters.

**AIMS AND OBJECTIVES**
In the meeting following objectives were considered:

1. 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.
2. To impart current knowledge and practical skills to Disaster Management graduates through theory, practical and field exercises.

The following decisions were made in the meeting 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 the all degree programmes to be offered by the HEC.
PART-I: SCHEME OF STUDY FOR BS (04 YEARS) PROGRAMME

ELIGIBILITY OF CRITERIA

DURATION
Four years programme spread over 8 semesters (i.e. two semesters per year).

DEGREE REQUIREMENT
Minimum of 124 credits are required to complete 4 years BS in Disaster Management.

EVALUATION
For the uniformity in the evaluation system, NCRC recommends that the minimum CGPA required to pass a semester is 2.0 out of 4.0 at undergraduate level or decided by the respective bodies of the university as per rules in vogue.

STANDARDIZED FORMAT / SCHEME OF STUDIES FOR FOUR-YEAR INTEGRATED CURRICULA FOR BACHELOR DEGREE IN BASIC, SOCIAL, NATURAL AND APPLIED SCIENCES

STRUCTURE

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Categories</th>
<th>No. of courses Min – Max</th>
<th>Credit Hours Min – Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>General Courses to be chosen from other departments</td>
<td>7 – 8</td>
<td>21 – 24</td>
</tr>
<tr>
<td>3.</td>
<td>Discipline Specific Foundation Courses</td>
<td>9 – 10</td>
<td>30 – 33</td>
</tr>
<tr>
<td>4.</td>
<td>Major Courses including research project / Internship</td>
<td>11 – 13</td>
<td>36 – 42</td>
</tr>
<tr>
<td>5.</td>
<td>Electives within the major</td>
<td>4 – 4</td>
<td>12 – 12</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>40 – 44</td>
<td>124 – 136</td>
</tr>
</tbody>
</table>

➢ Total numbers of Credit hours 124-136
➢ Duration 4 years
➢ Semester duration 16-18 weeks
➢ Semesters 08
➢ Course Load per Semester 15-18 Cr hr
➢ Number of courses per semester 4-6 (not more than 3 lab / practical courses)
# LAHOUT FOR BS DISASTER MANAGEMENT

<table>
<thead>
<tr>
<th>Compulsory Requirements (the student has no choice)</th>
<th>General Courses to be chosen from other departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 courses</td>
<td>7-8 courses</td>
</tr>
<tr>
<td>25 Credit hours</td>
<td>21-24 Cr. Hours</td>
</tr>
<tr>
<td><strong>Subject</strong></td>
<td><strong>Subject</strong></td>
</tr>
<tr>
<td>1. English I</td>
<td>1. Fundamentals of Geography</td>
</tr>
<tr>
<td>2. English II</td>
<td>2. General Geology</td>
</tr>
<tr>
<td>3. English III</td>
<td>3. Introduction to Environmental Science</td>
</tr>
<tr>
<td>5. Pakistan Studies</td>
<td>5. Introduction to Economics</td>
</tr>
<tr>
<td>6. Islamic Studies / Ethics</td>
<td>6. Introduction to Psychology</td>
</tr>
<tr>
<td>7. Mathematics I</td>
<td>7. Fundamentals of GIS and RS</td>
</tr>
<tr>
<td>9. Introduction to Computer</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

## Discipline Specific Foundation Courses

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic Science of Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>2. Fundamental of Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>3. Basic Principles of Disaster Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>4. Disaster and Sustainable Development</td>
<td>3</td>
</tr>
</tbody>
</table>

## Major courses including research project/internship

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Research Approaches in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>2. Applied Geomorphology and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>3. Gender Mainstreaming in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>4. Economics of Disasters</td>
<td>3</td>
</tr>
</tbody>
</table>

## Elective Courses within the major

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective-I (7)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-II (7)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-III (8)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-IV (8)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9-10 courses</th>
<th>11-13 courses</th>
<th>4 courses</th>
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<tbody>
<tr>
<td>30-33 Credit hours</td>
<td>36-42 Credit hours</td>
<td>12 Credit Hours</td>
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## Subject

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic Science of Natural Hazards</td>
<td>3</td>
</tr>
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<td>2. Fundamental of Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>3. Basic Principles of Disaster Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>4. Disaster and Sustainable Development</td>
<td>3</td>
</tr>
<tr>
<td>5. Fundamentals of Geography</td>
<td>3</td>
</tr>
<tr>
<td>6. General Geology</td>
<td>3</td>
</tr>
<tr>
<td>7. Introduction to Environmental Science</td>
<td>3</td>
</tr>
<tr>
<td>8. Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>9. Introduction to Computer</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
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<tbody>
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<td>3</td>
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<tr>
<td>2. Applied Geomorphology and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>3. Gender Mainstreaming in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>4. Economics of Disasters</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective-I (7)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-II (7)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-III (8)</td>
<td>3</td>
</tr>
<tr>
<td>Elective-IV (8)</td>
<td>3</td>
</tr>
<tr>
<td>Course</td>
<td>Credits</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>5. Community Based Disaster Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>6. Hydro-meteorological Hazards</td>
<td>3</td>
</tr>
<tr>
<td>7. Geo-Hazards</td>
<td>3</td>
</tr>
<tr>
<td>8. Complex &amp; Biological Hazards</td>
<td>3</td>
</tr>
<tr>
<td>9. Emergency Management</td>
<td>3</td>
</tr>
<tr>
<td>10. Disaster Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>11. Climate Change and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>12. Hazard Mapping Techniques</td>
<td>2+1</td>
</tr>
<tr>
<td>13. Practical in Disaster Management</td>
<td>1+2</td>
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<table>
<thead>
<tr>
<th>Total Credits</th>
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<tbody>
<tr>
<td>30</td>
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* University has the option to recommend any other course in lieu of English IV
** University may recommend any other course in lieu of Mathematics II
## Scheme of Studies for BS in Disaster Management

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Titles</th>
<th>Credit Hrs.</th>
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<tbody>
<tr>
<td></td>
<td>English-I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Pakistan Studies</td>
<td>2</td>
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<tr>
<td></td>
<td>Math/Stat-1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-I Fundamentals of Geography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-II General Geology</td>
<td>3</td>
</tr>
<tr>
<td>DM 311</td>
<td>FOUNDATION-I Basic Science of Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>English-II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Islamic Studies / Ethics</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Math/stat-II / Univ. Optional</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-III Introduction to Environmental Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-IV Sociology</td>
<td>3</td>
</tr>
<tr>
<td>DM 321</td>
<td>FOUNDATION-II Fundamental of Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>English-III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduction to Computer</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-V Introduction to Economics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-VI Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>DM 431</td>
<td>FOUNDATION-III Basic Principles of Disaster Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>English-IV / Univ. Optional</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>G-VII Fundamentals of GIS and RS</td>
<td>2+1</td>
</tr>
<tr>
<td></td>
<td>G-VIII Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 441</td>
<td>FOUNDATION-IV Disaster and Development</td>
<td>3</td>
</tr>
<tr>
<td>DM 442</td>
<td>FOUNDATION-V Introduction to CBDRM</td>
<td>3</td>
</tr>
<tr>
<td>DM 551</td>
<td>FOUNDATION-VI Hydro-meteorological Hazards</td>
<td>3</td>
</tr>
<tr>
<td>DM 552</td>
<td>FOUNDATION-VII Geo-Hazards</td>
<td>3</td>
</tr>
<tr>
<td>DM 553</td>
<td>FOUNDATION-VIII Biological &amp; Complex Hazards</td>
<td>3</td>
</tr>
<tr>
<td>DM 554</td>
<td>MAJOR-I Research Approaches in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 555</td>
<td>MAJOR-II Applied Geomorphology and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>DM 556</td>
<td>MAJOR-III Mainstreaming Gender in Disaster Management</td>
<td>3</td>
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Total: 18
## List of Courses

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Titles</th>
<th>Credit Hrs.</th>
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<tbody>
<tr>
<td>DM 561</td>
<td>FOUNDATION-IX Emergency Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 562</td>
<td>FOUNDATION-X Disaster Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 563</td>
<td>MAJOR-IV Fundamentals of Economics of Disasters</td>
<td>3</td>
</tr>
<tr>
<td>DM 564</td>
<td>MAJOR-V Disaster Project Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 565</td>
<td>MAJOR-VI 6. Multi-Hazards Vulnerabilities</td>
<td>3</td>
</tr>
<tr>
<td>Proj 569</td>
<td>MAJOR-VII Research Project /Internship</td>
<td>1+2</td>
</tr>
<tr>
<td>DM 671</td>
<td>MAJOR-VIII Introduction to Natural Hazards of Pakistan</td>
<td>3</td>
</tr>
<tr>
<td>DM 672</td>
<td>MAJOR-IX Disasters Risk and Cities</td>
<td>3</td>
</tr>
<tr>
<td>DM 673</td>
<td>MAJOR-X GIS and RS in Disaster Management</td>
<td>2+1</td>
</tr>
<tr>
<td></td>
<td>ELECTIVE-I</td>
<td>3</td>
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<tr>
<td></td>
<td>ELECTIVE-II</td>
<td>3</td>
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<tr>
<td>DM 674c</td>
<td>Public Private Partnerships for DRR</td>
<td>3</td>
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<tr>
<td>DM 681</td>
<td>MAJOR-XI Climate Change and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>DM 682</td>
<td>MAJOR-XII Techniques of Hazard Mapping</td>
<td>2+1</td>
</tr>
<tr>
<td>DM 683</td>
<td>MAJOR-XIII Practical in Disaster Management</td>
<td>1+2</td>
</tr>
<tr>
<td></td>
<td>ELECTIVE-III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ELECTIVE-IV</td>
<td>3</td>
</tr>
<tr>
<td>DM 684a</td>
<td>Disaster Management Policies</td>
<td>3</td>
</tr>
<tr>
<td>DM 684b</td>
<td>Good Governance and Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 684c</td>
<td>Disability and Disasters</td>
<td>3</td>
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</table>

**Total Credit Hours (124-136)** 130

**Note:** Students are allowed to select any four electives from the given groups.

### List of Elective Courses

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Titles</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM 674a</td>
<td>Climate Change Adaptation and Disasters</td>
<td>3</td>
</tr>
<tr>
<td>DM 674b</td>
<td>Structural and Non-Structural Measure in DM</td>
<td>3</td>
</tr>
<tr>
<td>DM 674c</td>
<td>Ageing and Disasters</td>
<td>3</td>
</tr>
<tr>
<td>DM 674d</td>
<td>Public Private Partnerships for DRR</td>
<td>3</td>
</tr>
<tr>
<td>DM 674e</td>
<td>Environment and Hazards Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 674f</td>
<td>Humanitarian Crisis Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 675a</td>
<td>Child Friendly Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>DM 675b</td>
<td>Earthquake Hazard Risk Reduction</td>
<td>3</td>
</tr>
<tr>
<td>DM 675c</td>
<td>Quantitative Techniques for Disaster Management</td>
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<tr>
<td>DM 675d</td>
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<td>Psychological Impacts of Disasters</td>
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<td>Role of Media in Disaster Management</td>
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**DETAIL OF FOUNDATION COURSES**

**Foundation-I**

**DM 311 Basic Science of Natural Hazards**

**Course Objectives:**

i. To understand the science of natural phenomena.

ii. To figure out the geomorphic processes.

iii. To interlink the geomorphic processes with natural hazards.

iv. To explore the mechanism of natural hazards occurring.

**Course Contents:**

- Scientific Method and Principles of Science
- Universe, Solar System, Earth
- Concept of Time, Space, Scale, Matter, Energy, Form and Geomorphic Processes
- Spheres of the Earth (Litho, Hydro, Bio and Atmosphere)
- Plate Tectonics
- Earth Heat Budget System
  - Earth Albedo
  - Green House Effects
- Gaseous Cycles
- Eco-Systems, Food Chain and Energy Chain
- Hydro-meteorological System
- Weather and Climate
- Natural Hazards
  - Geo-hazards
  - Hydro-meteorological Hazards

**Recommended Books:**


Foundation-II

DM 321  Fundamental of Disaster Management  Cr. H. 3

Course Objectives:

i. This module provides basic knowledge of hazards, disasters, risks, vulnerability and capacity including natural, climatic and human induced factors and associated impacts.

ii. On completion of this module, students should understand the nature and types of disasters, associated risks and impacts to these disasters.

Course Contents:

- Definitions of Natural Hazards and Disasters
- Classification of Natural hazards
- Classification of Disasters
- Disaster risks
- Vulnerabilities
- Capacities
- Hydro-Meteorological Hazards
- Geo Hazards
- Complex and Biological Hazards
- Disaster Risk Reduction and Disaster Risk Transfer

Recommended Books:


Basic Principles of Disaster Planning and Management

Course Objectives:

i. To know the different phases of disaster management cycle.
ii. To know the multidisciplinary and multispectral approach in DM.

Course Contents:

- Introduction to Disaster Planning and Management
- Significance of Disaster Planning and Management
- Disaster Management Cycle
  - Prevention
  - Mitigation
  - Preparedness
  - Impact
  - Response
  - Recovery
  - Development
- Hazards and Resources
- Man and Environment Relationship
- Risk as the product of hazard and vulnerability
- Vulnerability
  - Types of Vulnerability
  - Causes of increasing Vulnerability
- Capacity
  - Types and level of Capacity
  - Triggers for Capacity Development
  - Capacity Dimension
- Elements at Risk
- Planning Process
- Modern Challenges in Disaster Management
- National Disaster Management Policy and Legislation

Recommended Books:


Foundation-IV

DM 441 Disaster and Sustainable Development Cr. H. 3

Objectives:
At the end of this module, the students shall be able to understand the strong interrelationship existing between Disasters and Sustainable Development.

Course Contents:
- Forging the links between disasters and development
- NDMA Act 2010
- The dilemma of sustainability
- The Concept & Historical Perspective of Sustainable Development
- Medium Term Development Framework
- The Conceptual Relationship between Disasters and Development
- Disasters – A challenge for developing countries and development cooperation
- 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

Recommended Books:

Foundation-V

DM 442 Community Based Disaster Risk Management Cr. H. 3

Course Objective:
To make the students understand various participatory approaches/strategies and their application in Disaster Management.

Course Contents:
- Introduction to CBDRM
- Definition, types and essential elements of community
- Sociological criteria of a good community
- The character of resilient communities
- Importance of community based disaster risk management
- Recognition of the need for community involvement, ownership and participation
- Key points on the CBDRM approach
- Community based disaster risk management process
- Community based risk, needs and damage assessment
- Participatory methods and tools of risk assessment
- Guidelines for good practice in community based disaster risk management
- Participatory disaster risk management planning
- Community managed implementation of risk reduction measures
- Major considerations in undertaking in CBDRM

Recommended Books:

Foundation-VI

DM 551 Hydro-meteorological Hazards Cr. H. 3

Course Objectives:
   i. To understand the Hydro-meteorological processes and to interlink the Hydro-meteorological processes with natural hazards
   ii. To learn about Hydro-meteorological hazards risk and its management.

Course Contents:
   ▪ Introduction to Hydro-meteorological Hazards
   ▪ Hydrosphere and Atmospheric Circulations
   ▪ Concepts in Meteorology
   ▪ Hydro-meteorological Processes and Its Impacts
   ▪ Types of Hydro-meteorological Hazards
      o Cyclones
      o Thunderstorms, Windstorm, Hail, Snow Squalls, Cloud Bursting
      Sand storms, Dust storms etc.
      o Floods/Flash Floods
      o Cold Wave/Intense Cold, Heat Waves/Excessive Heat etc.
      o Tide Waves, Tsunamis/Seismic sea waves,
      o Drought
      o Forest fires/Bush fires
      o Smoke Volcanic Ash
      o Avalanches
   ▪ Causes, Intensifying Factors, Impacts, Mitigation and Preventive Measures
   ▪ Early Warning System for Hydro-Meteorological Hazards

Recommended Books:
Summer Campus, University of Peshawar, Khyber Pakhtunkhwa, Pakistan.


**Foundation-VII**

**DM 552**  **Geo-Hazards**  **Cr. H. 3**

**Course Objectives:**

i. To understand the plate tectonic mechanism and to interlink the plate tectonics activities and Geo-hazards.

ii. To learn about Geo-hazards risk and its management.

**Course Contents:**

- Introduction to Geo-hazards
- Plate Tectonic and Plate Boundaries
- Global Distribution of Earthquakes and Volcanoes
- Folding, Faulting and Fault Lines
- Types of Geo-hazards
  - Earthquake
  - Volcanoes
  - Tsunami
  - Landslide/Mass wasting
  - Glacial Lake Outburst Floods
  - Associated Hazards
- Causes, Intensifying Factors and Impacts
- Mitigation and Preventive Measures
- Geo-hazards Risk Assessment
- Early Warning System for Geo-hazards

**Recommended Books:**


Foundation-VIII

DM 553 Complex & Biological Hazards Cr. H. 3

Course Objectives:
   i. To understand the phenomena biological and complex hazards
   ii. To learn about biological and complex hazards risk and its management.

Course Contents:
   • Introduction to biological and complex hazards
   • Definition of Complex/Technological/Man-Made hazards
   • Types of complex hazards
     o Complex emergencies/conflicts
     o Famine
     o Displaced populations
     o Industrial accidents
     o Transport accidents
     o Nuclear Hazards
     o Anthropogenic hazards
   • Risk assessment of complex hazards
   • Risk Reduction measures for complex hazards
   • Types of biological hazards
   • Transmission of biological hazards
   • Epidemics and Pandemics
   • Risk assessment of biological hazards
   • Controlling exposure to biological hazards
   • Occupational Hazards Safety

Recommended Books:
Course Objectives:

i. To understand Emergency Process and Disaster Consequences
ii. To know the Emergency Response Mechanism.
iii. To develop skills for Emergency Response Management.

Course Contents:

- Disasters and Emergency Situation
- The nature of Emergency Situation
- Phases of Emergency Management (Mitigation, Preparedness, Response and Recovery)
- Emergency Mitigation (Risk Assessment, Precautionary Measures, Minimizing the Risk)
- Preparedness for Response (Training, Planning, Plan, and Institutions)
- Response
  - Early Warning System,
  - Evacuation,
  - Rapid Need Assessment and Preliminary Damages Assessment
  - Search and Rescue
  - Triage
  - Medical First Aid
  - Fire Fighting
  - Hospital
  - Security
  - Relief
  - Camp Management
- Emergency Response Organizations (Federal, Provisional, District, Community, Individual, NGOs)
- Emergency Operation Centre
- SPHERE Standards

Recommended Books:


Foundation-X

DM 562 Disaster Risk Management Cr. H. 3

Course Objectives
i. To understand Risk of Disasters and their Consequences
ii. To know about the risk assessment of disasters
iii. To familiar with the measures taken for disaster risk reduction.

Course Contents
- Introduction to Risk of Disasters
- Disaster Risk Management Phases (Recovery, Development, Prevention and Mitigation)
  o Disaster Risk: The Global Problem
  o Understanding the nature of risk
  o Emerging trends in hazards, vulnerability patterns and the impact of disasters
  o Risk and Community: Perception, Determination and Adjustment
  o Building of Resilient Community
  o Risk Assessment
  o Strategies for Risk Management
  o Key Techniques Used in Disaster Risk Assessment
  o Gender Sensitive Risk Assessment
  o Risk Treatment and Management

Recommended Books

**DETAIL OF SUBJECT MAJOR COURSES**

**MAJOR-I**

**DM 554 Research Approaches in Disaster Management**  
Cr. H. 3

**Course Objectives:**

i. To understand research in the field of Disaster Management.
ii. To understand the nature of data in Disaster Management.
iii. To use statistical techniques for data collection, analysis and interpretation.

**Course Contents:**

- Introduction Research Techniques in Disaster Management
- Types of Research
- Basic Elements of Scientific Research Methodology
- Research in the Field of Disaster Management
- Research Process
- Theory and Hypothesis
- Methods/Techniques of Data Collection and Analysis
- Questionnaire Design, Field Survey, Analysis, Interpretation
- Data Classification and Tabulation
- Sample and Sampling
- Measures of Central Tendency
- Measures of Dispersion
- Comparisons
- Computer Based Statistics (SPSS16/MS Excel etc.)
- Writing a Research Proposal

**Recommended Books:**

MAJOR-II

DM 555  Applied Geomorphology and Natural Hazards  Cr. H. 3

Course Objectives:
  i. To know the geomorphological processes and extreme natural events.
  ii. To interlink the geomorphic processes with natural hazards
  iii. To understand the man and environment dynamic relationship.
  iv. To apply the geomorphic techniques in the study of natural hazards.

Course Contents:
- Introduction to Geomorphology
- Geomorphic Processes
- Classification of Geomorphic Processes
- Endogenous Hazards
  - Earthquakes
  - Volcanism
- Exogenous Hazards
  - Rivers and Flood Plains and Flooding
  - Drought
  - Glacial and Associated Hazards
  - Soil Erosion by Water and Wind
  - Weathering, Causes, Implication
  - Desertification, Causes and Implication
  - Mass Movement Hazards
- Geomorphological Mapping
- Geomorphology and Environment
- Geomorphology in Disaster Management

Recommended Books:

MAJOR-III

Gender Mainstreaming in Disaster Management

Course Objective:
To know the impacts of disaster on women and to study the contribution of women in disaster management.

Course Contents:
- Gender and gender relations in disasters
- Women in society
- Perspective of gender: A missing element in disaster
- Gender inequality, vulnerability and disaster
- Gender Specific Needs and Issues
- Differential impact of disaster on women in different life cycle stages
- Role of women in disaster management
- Women involvement in reconstruction and development phase following an emergency and/or disaster
- Psychosocial considerations: prevention, mitigation and preparedness
- Community mobilization through women
- Case studies of women responding to disaster

Recommended Books:

MAJOR-IV

DM 563  Economics of Disasters  Cr. H. 3

Objectives:

i. This module will enable the students to analyse the broad spectrum of disaster management from economic perspective.

i. To help the students to understand the economic impacts of disasters at local, regional, national and international level.

Course Contents:

- Understanding the economic and financial impacts of disasters
- Economic Impacts of Disasters in Pakistan
- Nature of Economic Aid after Disasters
- Insurance Against Disaster Losses
- Financial and economic tools
- Effects of Disasters on Capital Accumulation
- Economic Resilience to Disasters
- Public Finance and Disasters
- Economic cost of Disasters
- Financing the Cost of Future Disasters
- Significance of Insurance in risk reduction across developing countries
- Making Disaster Risk Reduction and Insurance Work Together.

Recommended Books:


MAJOR-V

DM 564 Disaster Project Management Cr. H. 3

Objectives:
This module will groom the students as project managers; whereby they will be able to understand the functional requirements of Projects.

Course Contents:
- Introduction to Project Cycle
- Project Management- Basic concepts
- Project Management International Standards
- Project planning and Documentation
- Project Management in NGOs
- Project Management Methodologies
- Project Management Body of Knowledge (PMBOK)
  - Project Management Knowledge Areas
- Project Scheduling & Critical Path Method
- Project Selection Models and Types
  - Decision Aiding Models
  - Criteria for Project Selection
- Types of Project Selection Models
- Project Risk Management
- Change Management
- Monitoring and Evaluation
- Introduction to Project Management Software
  - MS Project Office / Primavira

Recommended Books:

MAJOR-VI

DM 565 Multi-Hazards Vulnerabilities Cr. H. 3

Course Objectives:

i. To familiarize the students with Physical, Economic, Social and Attitudinal Vulnerabilities in context of different hazards.

ii. To understand the dynamics of Geo-spatial and Multi-hazards Vulnerabilities

Course Contents:

- Introduction to Multi-Hazards Vulnerabilities
- Hazards: Types, Intensity, Density and Frequency
- Vulnerability: Types, Root and Underlying Causes
- Geo-Spatial Characteristics of Hazards and Vulnerability
- Flash, Riverine and Coastal Floods and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- Earthquake and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- Drought and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- Desertification and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- Mass Movements and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- GLOFs and associated Physical, Economic, Social and Attitudinal Vulnerabilities
- Geo-Spatial Analysis of Multi-hazards Vulnerabilities
- Multi-hazards Vulnerabilities and Resilience

Recommended Books:

1. DISASTER Risk Management and Vulnerability Reduction
   www.adpc.net/infores/adpc-documents/PovertyPaper.pdf
2. HANDBOOK: International Federation of Red Cross and Red Crescent Societies. What is VCA? An introduction to vulnerability and capacity assessment.

4. MULTI Hazard Risk Assessment using GIS  
   www.adpc.net/audmp/llw/themes/th1-westen.pdf


MAJOR-VIII

DM 671 Natural Hazards of Pakistan Cr. H. 3

Course Objectives:
   i. To familiarize with physiography of Pakistan.
   ii. To understand the nature, causes, consequences and remedies of the natural hazards occurring in Pakistan.

Course Contents:
   • Introduction to Natural Hazards and Disasters
   • Physiography of Pakistan
   • Climate of Pakistan
   • Ecological Regions of Pakistan
   • Seismic Hazards Zone of Pakistan
   • Major Natural Hazards of Pakistan
      o Floods
      o Earthquakes
      o Tsunami
      o Landslides
      o Desertification
      o Drought
      o Cyclone
      o Snow Avalanches
      o Glacial Hazards
      o Salinization
      o Heat and Cold Waves
      o Sea Water Intrusion
   • Future Disaster Trends in Pakistan
Recommended Books:

MAJOR-IX

DM 672 Disasters Risk and Urbanization Cr. H. 3

Course Objectives:
1. To know about city structure and associated problems.
2. To understand the process of urbanization.
3. To have knowledge of urban hazards and risk reduction measures.

Course Contents:
- Introduction to Disasters Risk and Urbanization
- City Structure
- Population distribution in city and social classes
- Urbanization (Definition, Causes, Impacts)
- Problems of Urbanization
- 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, Emergency services etc.
  - Geology, hydrology, drainage, soil etc.
- Risk Reduction Measures.
  - Improvement of civic services.
  - Emergency response mechanism.
  - Hazard specific measures.
Recommended Books:

MAJOR-X

Geographic Information System and Remote Sensing in Disasters Management

Objectives:

i. To enhance the skills of students in understanding of GIS and RS.
ii. To enable the students to develop, interpret and analyse the hazards maps.

Contents:

- Important of spatial data in disaster management
- Acquisition of GIS and Remote Sensing data for disaster management
- Data collection techniques
- Application of GIS and Remote Sensing data for disaster management
- Role of GIS and RS in Mitigation and Preparedness
- Role of GIS and RS in Disaster Response and Recovery
- Role of GIS and RS in Disaster Risk Assessment
- Preparation of different thematic maps; exercises on creating maps for different disasters.

Recommended Books:

MAJOR-XI

DM 681 Climate Change and Natural Hazards Cr. H. 3

Course Objectives:
   i. To understand the process of climate change.
   ii. To interlink the natural hazards and climate change.

Course Contents:
   - Introduction to Climate Change and Natural Hazards
   - Weather and Climate
   - Global Climatic Regions
   - Role of Oceans
     - Surface Current, Carbon sink
     - El-Nino and La-nina Effect,
   - Hydro-Meteorological System
   - Causes of Climate Change (Natural and Anthropogenic)
   - Impacts of Climate Change
   - Global Warming
   - Extreme Weather Events
   - Hydro-meteorological Hazards and Disasters
   - Global Distribution of Hydro-meteorological Disasters

Recommended Books:
Course Objectives:

i. To know about the basic elements of a map.
ii. To understand the hazard variables.
iii. To learn methods 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
- Types and variables of Hazards
- Map Making Techniques
  - Sketch Map
  - Drawing Tools
  - Surveying Tools
  - Computer Aided Cartography
  - GIS
  - Multi-Tool Mapping
- Limitation of Hazards Mapping

Recommended Books:

Objectives:
I. To provide to the students an understanding of various tools and techniques used for disaster risk assessment.
II. To train the students through practical activities of ERM for conduct emergency response activities in case of various of disaster.

Course Contents:
- Map reading
  - Topographic Maps
  - Weather Maps
  - General Maps
- Distance, shape and area analysis on a map
- Drainage Pattern analysis
- Contour and Slope analysis
- Hazard, Risk and Mapping
- Basics of Emergency Response
- Search and Rescue (Types, equipment and training)
- Fire Fighting
  - Types of Fire
  - Fire Prevention
  - Types of Fire Extinguishers and its application
- First Aid
  - Vital Sign
  - Basic Life Support (ABC + CPR)
  - Wounds and its Types: Pre-Hospital Management.
  - Basic Guidelines for Management of Fractures
  - Burn Injuries
  - Safe Transportation of Patient
  - Foreign Body Airway Obstruction (FBAO)
  - First aid for Climatic Injuries

Recommended Books:
DETAIL OF ELECTIVE COURSES

Elective (Semester 07)

DM 674a  Climate Change Adaptation and Disasters  Cr. H. 3

Course Objectives:

i. To understand current issue of climate variability and change.
ii. To explore relation between climate change adaptation and disaster risk management.

Course Contents:

- Introduction to Climate Change Adaptation
- Climate change and climate variability
- Risk of Disasters and Climate Change
- Major impacts of climate change: Agriculture, Water resources, Forestry, Biodiversity, human health and hydro-meteorological disasters
- Climate Change and Extreme Hydro-meteorological Events
- Climate Change and Vulnerabilities
- Assessing the impacts and vulnerabilities to climate change and adaptation Climate Change Mitigation
- Climate Change Adaptations
- Local coping strategies, indigenous knowledge in climate change adaptation
- Climate Change adaptation needs in Pakistan-agriculture, water, forestry, biodiversity, health etc.

Recommended Books:

Elective (Semester 07)

DM 674b Structural and Non-Structural Measures in DRM Cr. H. 3

Course Objectives:

i. To understand floods and landslides hazards and disaster risk reduction.
ii. To know about risk reduction techniques and measures for flood and landslides.

Course Contents:

- Introduction to Structural and Non-Structural Measures in DRM
- Floods, Earthquakes, Landslides, Windstorms, Blasts, and Desertification
- Structural Measures
  - Channelization: Dredging, Straightening,
  - Construction of protective structures: Spurs, Marginal bund or levees, Embankments
  - Relief or by pass channel
  - Construction of reservoirs and dams
  - Retaining walls (gabion, stone masonry. PCC, RCC, vegetated concrete block, vegetated crib etc.),
  - Diversion channels, Surface drains, Subsurface drains.
- Soil Bioengineering Measures
- Biological measures
- Non-Structural Measures

Recommended Books:

Elective (Semester 07)

**DM 674c**  
**Ageing and Disaster**  
**Cr. H. 3**

**Course Objective:**
The objective of this course is to understand the concept of aging and see the role of senior people in disaster management.

**Course Content:**
- Introduction to Ageing
- Social Ageing and the Life Course Perspective
- Cultural Images of Ageing
- Theoretical Analysis of ageing
- Madrid International Plan of Action on Ageing, 2002
- Employment Old Age Benefit Institution
- Problems of Old Age People
- Problem of older People in disaster
- Disasters and the Vulnerability of Older Populations
- Displacement, separation and return
- Capacities and contribution social capital during disaster
- Senior People and Sphere Standards
- Case Studies: Help Age older people associations in community disaster risk reduction.

**Recommended Books:**


Elective (Semester 07)

DM 674d Public Private Partnerships for Disaster Risk Reduction

Objectives:
The module shall enable the students to understand the significance challenges of Public Private Partnership for DRR.

Course Contents:
- Introduction to the Public Private Partnerships
- Public Private Partnership for Disaster Risk Reduction
- Private sector involvement in DRR
- The business case for corporate sector involvement in DRR
- The role of the private sector in DRR
- Case studies of private sector involvement in DRR activities
- Current legislative and institutional framework for PPPs for DRR
- Recommendations for strengthening partnerships
- Way forward/Evolving Concepts in PPP for DRR with special reference to Pakistan

Recommended Books:

Elective (Semester 07)

DM 674e Environment and Hazards Management

Course Objectives:
- To know the basic components of environment.
ii. To understand the relationship between Man and Environment.

iii. To interlink environmental problems with natural hazards.

Course Contents:
- Introduction to Environment and Natural Hazards
- Environment and their Components
- Sustainable Use of Resources for DRR
- Spheres of the Earth (Litho, Hydro, Bio and Atmosphere)
- Earth Heat Budget System
- Green House Effects
- Global Warming
- Type of Environments
- Eco-Systems, Food Chain and Energy Chain
- Environment and Resources
- Economic Activities & Environment
- Pollution and Disasters
- Environmental Hazards

Recommended Books:

Elective (Semester 07)

DM 674f Humanitarian Crisis Management Cr. H. 3

Course Objective:
i. To understand the dynamics of conflict areas involved in humanitarian crises management.

ii. To appreciate the challenges of humanitarian aid interventions for individuals and organisations in conflict areas due to internal (for example, civil war and ethnic disputes) or external factors (for example war in Afghanistan and Palestine).

Course Contents:
- Understanding humanitarianism: why the world has responsibility to help
- Poor competing against poor to become projects: how humanitarian organisations choose where to work and where not to work; who gets international aid and how much
- Challenges of humanitarian organisations working in conflict areas: how to be perceived as neutral to stay safe and undertake development
- How to ensure human security, vulnerability reduction and sustainability in humanitarian crises
- The role of mediation in managing international crises
- Best practices in humanitarian crises management
- Practicing humanitarianism: difference between rhetoric and reality
- Responding to an international call for humanitarian crises as a disaster response manager
- Studying World Health Organisation practice as a case in point

**Recommended Books:**
3. VICTOR, Asal, David Quinn, Jonathan Wilkenfeld, Kathleen Young, Mediating International Crises (Routledge Advances in International Relations and Global Politics), Routledge, 2006, London

**Elective (Semester 07)**

**DM 675a  Child Friendly Disaster Management**  Cr. H. 3

**Course Objectives:**

i. To understand the situation of children in Pakistan and at the global level.

ii. To explore how disaster affect the children.

iii. To find out the contribution of children in disaster preparedness and management.

**Course Contents:**

- Definition of Child
- Violence against Children
- Vulnerability of Children to disasters
- Direct and Indirect impacts of Disaster on Children
- Specific Needs of Children During Disaster
- International Conventions on the rights of children in emergency
- Guidelines for child friendly disaster management and response
- Responding to Child Trauma
- Mainstreaming DRR Education into School curricula
- School Emergency Planning and Management
- Case studies on Child Friendly Disaster Management

**Recommended Books:**
1. ADPC (2007) Child Focused Disaster Risk Reduction, Module 6: Community Disaster Risk Reduction Implementation, 16th Community Based Disaster Risk Management Course, Bangkok.
4. MURTHY and Josephine (2006) A Study on Non-Discrimination in the Tsunami Rehabilitation Programme in India, Save the Children Tsunami Rehabilitation Programme in India

**Elective (Semester 07)**

**DM 675b  Earthquake Hazard Risk Reduction  Cr. H. 3**

**Course Objectives:**
To understand the nature, causes, consequences and remedies of the earthquake hazard.

**Course Contents:**
- Introduction to Earthquake Hazard Management
- Earthquake Seismology
- Earthquake Hazard and Vulnerabilities
- Earthquake and Associated Secondary Hazards
- Seismic Zonation and Micro-Zonation with reference to Pakistan
- Earthquake Hazard Reduction Measures (Structural and Non-Structural)
- Structure, Design and Material of the Buildings
- Preparedness (Individual, Family, Community, Early Warning System, Institutions, Awareness etc.)

**Recommended Books:**

**Elective (Semester 07)**

**DM 675c Quantitative Techniques for Disaster Management**

**Cr. H. 3**

**Objectives:**
To give students hands on experience in quantitative techniques that can be used in Disaster Management.

**Course Contents:**
- The Basic Concepts
- Introduction to Quantitative Analysis
- Probability Concepts and Applications
- Decision Analysis
- Regression Models
- Forecasting Models
- Linear Programming Models
- Introduction to Global Circulation Models (GCM); Climate Change

**Recommended Books**
Course Objectives:

i. To know about the natural resources and its utilization.
ii. To explore the relationship of natural resources utilization and natural hazards.
iii. To understand the sustainable use of resources and disaster risk reduction.

Course Contents:

- Introduction to Natural Resources and Disaster management
- Natural Resources and its Classification
- Preservation, Conservation and Restoration of Natural Resources
- Natural Resources Policies and its Management
- Natural Resources and Human Environment Interaction
- Natural Resources and Development
- Ecological Balance Systems
- Natural Resources and Natural Hazards
- Impacts of Disasters on Natural Resources

Recommended Books:


Course Objectives:

i. To understand the disaster management framework and legislations in the context of global conventions.

Course Contents:

- Introduction to Global Regime in Disaster Management
- Global challenges and disasters
The linkage between Disasters and Millennium Developmental Goals (MDGs)
Approaches and Paradigm Shift at Global Level
International Decade for Natural Disaster Reduction (IDNDR) 1990-1999
Yokohama Strategy and Plan of Action – Mid-review IDNDR
International Strategy for Disaster Reduction (ISDR)
  o Public commitment and linkage to sustainable development, enlarged networking and partnerships. Mechanisms: IATF/DR, ISDR secretariat, UN Trust Fund
Johannesburg Plan of Implementation 2002
Kyoto Protocol 2008-2012
Disaster Risk Reduction tools for Climate Change Adaptation
UNISDR DRR Strategy
UN Su-O rganizations and DRR
Pakistan and DRR

Recommended Books:

Elective (Semester 08)
DM 684a Disaster Management Policies Cr. H. 3

Course Objectives:
  i. To enhance the policy analysis skills of the students.
  ii. To understand the disaster management framework and legislations in Pakistan in the context of global conventions.

Course Contents:
  • National Disaster Management System at Pakistan
    o Definition, Need, Objectives, Principles, Composition, Major functions
• Disaster Management Bodies at Regional, National and International level
• Guiding principles for policy
• Process of policy formulation, implementation and techniques in policy analysis
• Organizations with overall Disaster Management Responsibilities in Pakistan’s public sector
• Disaster Management and National Plans
• Legislation for Disaster Management
  o Civil Defence Act, 1952
  o The National Calamities Act (West Pakistan Calamities Act), 1958
  o Local Government Act, 2001
  o Emergency Services Ordinance/Act, 2002
  o Environment Legislation
  o National Disaster Management Act – 2010
  o ERRA Act 2011
• National Disaster Management Policy, 2013
• Analytical review of the international policies and frameworks
  o Yokohama Strategy
  o The Geneva Mandate
  o Kyoto Protocol
  o Hyogo Framework for Action (HFA)

Recommended Books:
Elective (Semester 08)

DM 684b  Good Governance in Disaster Management  Cr. H. 3

Objectives:
By the end of this course students shall be capable of understanding the significance of good governance in disaster management and its influence on good practices in disaster management.

Course Contents:
- Introduction to the Good Governance in Disaster Management
- Governance and its types
- Governance indicators (worldwide and Pakistan)
- DRR, Good Governance and Development
- Positioning disaster risk reduction in government
- Good governance for disaster management
- The role of the good governance in disaster management
- Good governance though development assistance
- Case studies of good governance in disaster management activities
- Learning Experiences: Governance issues in disaster management
  - Ownership of initiatives
  - Participation
  - Communication
  - Strengthening implementing capacity
  - Accountability
- Institutional and Policy Analysis for DRR in Pakistan
- Institutional Aid and Good Governance

Recommended Books:
Elective (Semester 08)

DM 684c           Disability and Disasters            Cr. H. 3

Course Objective:
The basic aim of this course is to expose students to key concepts of disability, how disaster affect the disable people and how to protect disable persons in disaster situation.

Course Contents:
- Introduction to the term disability
- Causes of Disability
- Disabled status in the world
- International conventions on disability
- National Policies on Disability in Pakistan
- Disaster and Disability Nexus
- Problems and Coping Mechanism during disaster
- Guidelines to include disability in disaster preparedness and management
- Protection of Life & Security during Disasters
- Assessment procedures in Intervention
- Role of CBOs in Rehabilitation of Disabled
- Physical, Sociological and Medical approaches for rehabilitation of Disable after disaster
- Livelihood Options for the Persons with Disabilities after disaster
- Best Practices

Recommended Books:
1. ABU-HABIB, Lina (1997) Gender and Disability, Women's Experiences in the Middle East, Oxford: Oxfam (UK and Ireland)
Elective (Semester 08)

DM 684d Health, Hygiene and Sanitation in Disaster Management

Course Objectives:
1. To explore the relationship of DM and Health.
2. To understand the consequences of disasters and Health response.
3. To know strategies for Health response in DM.

Course Contents:
- Introduction to Health Issues in Disaster Management
- Basic Elements of Public Health
- The Consequences of Disasters and Its Impacts on Public Health
- Public Health and Phases of Disaster Response
  - Acute Phase (Surgical, Rapid response, Ambulances etc.)
  - Non-Surgical
  - Chronic Phase
- Short Term Programmes
  - Mobile Clinic, Tele Health, Training, Restoration of Public Health Facilities, Safe Community, Rehabilitation Medicines, Drugs and Vaccines, Liaison with other Stakeholders of DM etc.
- Long Term Programmes
  - Medical Support
  - Rapid Response Unit
  - Field Hospital and Mobile Clinic
- Management of Health Issues in Disasters (Coordination, Logistics, Manpower etc.)

Recommended Books:

Elective (Semester 08)

DM685a Psychological Impacts of Disasters

Course Objectives:
1. To understand the psychological impacts of disasters.
To know about psychological Trauma.

**Course Contents:**
- Introduction to Psychological Impacts of Disasters
- Disaster Impacts
- Psychological Trauma
- Trauma response
  - Normal response, Basic principle, Bio psychosocial model, cultural influences
- Classification of Psychological Disorders
  - Depression, Anxiety, Post-traumatic stress disorder
- Children in Disasters
  - Development tasks, risk factors, and childhood traumatic grief
- Psychological and social support
  - Psychological first aid, coping strategies, and resiliency models

**Recommended Books:**

**Elective (Semester 08)**

**DPM 685b**  
**Flood Hazard Risk Reduction**  
**Cr. H. 3**

**Course Objectives:**
To understand the nature, causes, consequences and remedies of the flood hazard.

**Course Contents:**
- Introduction to Flood Hazard
- General Characteristics of Flood
- Causes of Floods
  - Meteorological
  - Hydrological
  - Anthropogenic
- Flood Intensifying Conditions
- Types of Floods (Riverine flood, Flash flood, Coastal flood, GLOF)
- Impacts of flood
- Basic Principles in Flood Hazard Assessment
- Integrated Flood Risk Management
- Flood Mitigation Measures
  - Structural (Engineering Protection)
  - Non-structural (Planning and Policies)
- Early Warning System for Floods

**Recommended Books:**

**Elective (Semester 08)**

**DPM 685c Basic Engineering Practices in Disaster Management**

**Course Objectives:**
1. To understand the role of various basic disciplines of engineering
2. Role of various engineering codes, guidelines and specifications
3. History of disasters with specific emphasis to Pakistan in context of engineering

**Course Contents:**
- Introduction to basic engineering fields and their role (Agricultural, Chemical, Civil, Electrical, Mechanical and Mining)
- Typical process of engineering project output (concept, feasibility, design, approval, execution, handover, management, maintenance, end of design life disposal)
- Basic concept of Planning Commissioning proformas (PC-I to PC-V)
- Introduction of concept of codes, guidelines, specifications in various engineering fields with few case studies (Building Code of Pakistan – Seismic Provisions; Pakistan Electric Safety Code; other international examples)
- History of various disasters in world with summary of engineering challenges
- History of various disasters in Pakistan with engineering challenges

**Recommended Books:**

**Elective (Semester 08)**

DM 685d **Role of Media in Disaster Management** Cr. H. 3

**Course Objectives:**

i. To understand the role of various stakeholders of media in disaster management.
ii. To study the impacts of media in disaster management.

**Course Contents:**

- Disasters and the media in a global age
- The geopolitics of disaster coverage
- Making disasters mean and politically matter
- The making of a newsroom and news editing
- Disaster citizenship and assumption of state responsibility
- Accountability of disaster news: ethics of disaster reporting
- Social media and disaster
- Essentials of successful disaster communication
- Learning the application of communication principles in different phases of disasters
- Understanding disaster communications audience
- Managing media relations as a disaster manager
- Building an effective plan, strategy and skill for disaster communication in a changing media world
- Terrorism communication challenges

**Recommended Books:**

Elective (Semester 08)

DPM 685e

Contingency Planning in Disaster Management

Cr. H. 3

Course Objectives:

i. To understand the role of various basic disciplines of engineering
ii. Role of various engineering codes, guidelines and specifications
iii. History of disasters with specific emphasis to Pakistan in context of engineering

Course Contents:

- Introduction to contingency Planning
- Preparedness: Organization. Training, Planning and/or Plans
- Planning Process
- 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

Recommended Books:

PART- II: 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, Space Sciences, Biological Sciences, Management Sciences, Agriculture Sciences, Medical Sciences, Economics, Sociology, Social Work, Psychology, Anthropology, Forestry, Architecture, Gender Studies, Journalism and Mass Communication, Civil / Earthquake / Agriculture / Mining Engineering, City / Urban & Regional Planning, Public Sciences, and Public Policies 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

<table>
<thead>
<tr>
<th>Course Structure</th>
<th>Number of courses</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency courses (Fundamental Courses, 0 Semester)</td>
<td>As required*</td>
<td>4-8</td>
</tr>
<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>
</tr>
</tbody>
</table>

* 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).

CORE COURSES (FIRST SEMESTER)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Titles</th>
<th>Cr.hr</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Disaster Risk Assessment</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Disaster Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Emergency Response Management</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Disaster Risk and Development</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Natural Hazards of Pakistan</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Community Based Disaster Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Research Methodology in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Disaster Response and Recovery</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Disaster Risk Reduction and Preparedness</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>Fundamentals of GIS and RS in Disaster Management</td>
<td>2+1</td>
</tr>
<tr>
<td>12</td>
<td>Statistical Techniques in Disaster Management</td>
<td>2+1</td>
</tr>
</tbody>
</table>

ELECTIVE COURSES (SECOND SEMESTER)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Titles</th>
<th>Cr.hr</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Application of Geo-informatics in Disaster Management</td>
<td>2+1</td>
</tr>
<tr>
<td>2</td>
<td>Climate Change and Disasters</td>
<td>3</td>
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<tr>
<td>3</td>
<td>Climate Change Adaptation and Disaster Mitigation</td>
<td>3</td>
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<td>4</td>
<td>Management of Desertification Hazard</td>
<td>3</td>
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<tr>
<td>5</td>
<td>Disaster Management and Economy of Pakistan</td>
<td>3</td>
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<tr>
<td>6</td>
<td>Disaster Management Policies</td>
<td>3</td>
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<tr>
<td>7</td>
<td>Disaster Risk and Vulnerabilities Assessment</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Disaster Risk Financing</td>
<td>3</td>
</tr>
</tbody>
</table>
THESIS (THIRD & FOURTH SEMESTERS)
MS. Thesis will be equal to six (06) credit hours which will be consisting of 15,000 plus words in semester 3 and 4. In addition, the research scholar will be required to publish a research article in HEC recognized Journals of any category.

DETAIL OF CORE COURSES
(First Semester)

DM 01 Introduction to Disaster Management Cr. H. 3

Course Objectives:
 i. To understand the basic concepts in Disaster Management.
 ii. To know the interrelation between Man and Disasters.
 iii. To understand the complicated and compound nature of all disasters.
 iv. To enable the students to phase out disasters consequences and their management.

Course Contents:
  Introduction to Disaster Management
  Definitions
  Environmental Processes
  Extreme Natural Events
  Man and Environment Relationship
  Hazards and Resources

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<tbody>
<tr>
<td>9</td>
<td>Disasters Risk and Urbanization</td>
<td>3</td>
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<tr>
<td>10</td>
<td>Management of Drought Hazard</td>
<td>3</td>
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<tr>
<td>11</td>
<td>Management of Earthquake Hazard</td>
<td>3</td>
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<tr>
<td>12</td>
<td>Economics of Disasters</td>
<td>3</td>
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<tr>
<td>13</td>
<td>EIA and Risk Assessment</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>Management of Flood Hazard</td>
<td>3</td>
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<tr>
<td>15</td>
<td>Forecasting of the Hydro-Meteorological Hazards</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Gender Mainstreaming in Disaster Management</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>Geomorphology and Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>Hazards Mapping</td>
<td>2+1</td>
</tr>
<tr>
<td>19</td>
<td>Impacts of Climate Change and Disasters in Pakistan</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>Management of Landslide Hazard</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>Livelihoods and Disasters</td>
<td>3</td>
</tr>
<tr>
<td>22</td>
<td>Disaster Planning and Management in Pakistan</td>
<td>3</td>
</tr>
<tr>
<td>23</td>
<td>Psychological Impacts of Disasters and its Management</td>
<td>3</td>
</tr>
<tr>
<td>24</td>
<td>Sociology of Disasters</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Media and Disasters</td>
<td>3</td>
</tr>
<tr>
<td>26</td>
<td>Contingency Planning</td>
<td>3</td>
</tr>
</tbody>
</table>
- Types of Natural Hazards
- Man-made Hazards
- Disasters
- Types of Disasters
- Causes, Consequences and Impacts of Disasters
- Disaster Management Cycle
- Vulnerability and its types
- Capacity and its types
- Risk

**Recommended Books:**

**DM 02 Disasters Risk Assessment** Cr. H. 3

**Course Objectives:**
- To understand the concept of Risk in DM.
- To know the basic elements of Risk Assessment.
- To develop skills for decision making in Disaster Risk assessment.

**Course Contents:**
- Basic Concepts (Geomorphic Process, Natural Hazard, Disaster, Vulnerability, Capacity and Risk)
- Hazard Assessment
  - Type, Nature of Occurrence, Location, Density, Intensity, Frequency
  - Data Availably and Quantifying the Hazards
- Vulnerability and/or 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, the 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

Recommended Books:

DM 03 Disaster Planning and Management Cr. H. 3

Course Objectives:
- To know the multidisciplinary and multispectral approach in DM.
- To know the basic elements of planning and plan preparation in DM.
- To understand the role of all stakeholders in DM.

Course Contents:
- Introduction to Disaster Planning and Management
- Planning Process
- Disaster Management
- Significance of Disaster Planning and Management
- Disaster Management Cycle
- Stages in Disaster Management
- Modern Challenges in Disaster Management
- National Disaster Risk reduction Policy
- Main Elements of National Policy
- Disaster Management Plan
- Major Requirements for Coping with Disasters
- The Basic Philosophy for Coping with Disasters
- Key Players in Disaster Management
- International Disaster Assistance
Recommended Books:

Course Objectives:
1. To link Emergency Management with DM.
2. To understand the Response Mechanism for an Emergency situation.
3. To develop skills for Emergency Response Management.

Course Contents:
- Disasters and Emergency Situation
- The nature of Emergency Situation
- Disaster Management and Emergency Management
- Phases of Emergency Management (Response, Recovery, Mitigation and Preparedness)
- Emergency Situation Analysis
- Emergency Response Organizations (Federal, Provisional, District, Community, Individual, NGOs)
- Emergency Operation Centre
  - Major Components of EOC
  - Organogram
  - Special Powers (Legislation)
  - Operational Plans
  - Logistics
  - Communications
- Key Stakeholders (Security Agencies, Emergency Response Units, Medical Care Units, Relief and Rehabilitation Organizations, Volunteers etc.)
• Emergency Mitigation (Risk Assessment, Precautionary Measures, Minimizing the Risk)
• Preparedness for Response (Training, Planning, Plan, and Institutions)

**Recommended Books:**

**DM 05 Disaster and Development Cr. H. 3**

**Course Objectives:**
i. To make understand the students about the interdependence of development measures and the natural hazards and disasters.
ii. The aims at the exploration of necessity of the integration of disaster risk reduction into the development projects.

**Course Contents:**
- Forging the links between disasters and development
- NDMA Act 2010
- The dilemma of sustainability
- The Concept & Historical Perspective of Sustainable Development
- Medium Term Development Framework
- The Conceptual Relationship between Disasters and Development
- Disasters – A challenge for developing countries and development cooperation
- 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
Recommended Books:

Course Objectives:
1. To familiarize with physiographic personality of Pakistan.
2. To understand the nature, causes, consequences and remedies of the natural hazards occurring in Pakistan.

Course Contents:
- Introduction to Natural Hazards and Disasters
- Physiography of Pakistan
- Climate of Pakistan
- Ecological Regions of Pakistan
- Seismic Hazards Zone of Pakistan
- Major Natural Hazards of Pakistan
  - Floods
  - Earthquakes
  - Tsunami
  - Landslides
  - Desertiﬁcation
  - Drought
  - Cyclone
  - Snow Avalanches
  - Glacial Hazards
  - Salinization
  - Heat and Cold Waves
  - Sea Water Intrusion
- Future Disaster Trends in Pakistan
- Disasters Management Policies in Pakistan
- Case studies

Recommended Books:


**Community Based Disaster Risk Management**

**Course Objectives:**
The main purpose of this course is to make the students understand various participatory approaches and strategies and their application in Disaster Management.

**Course Contents:**
- The concept of Group, Community and Society
- Social structure and social organization
- Perception and Attitude of Community towards Disasters
- Community Vulnerability
- Theories and Models of Participatory Development
- Participatory Tools and Techniques for Capacity, Vulnerability, Hazards and Risk Assessment
- Participatory Community Risk Assessment
- Participatory Disaster Risk Management Planning
- Community-Managed Implementation
- Participatory Monitoring and Evaluation
- Building Capacity and Resilience
- Disaster Risk Communication/ Awareness in DRR
- Mainstreaming of CBDRM in Public Policy, Planning and Implementation.
- Role of CBOs and NGOs

**Recommended Books:**


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Research Methodology in Disaster Management

Course Objectives:

i. To understand research particularly in the field of Disaster Management.

ii. To know the methods of data collection, analysis and interpretation.

iii. To develop research design for different case studies.

Course Contents:

- Introduction
- Types of Research
- The Nature of Research Approaches
  - Ethnographic, Survey and Experimental Style
- Basic Elements of Scientific Research Methodology
- Research in the Field of Disaster Management
- Research Process
- Methods/Techniques of Data Collection and Analysis
- Questionnaire Design, Field Survey, Analysis, Interpretation
- Data Classification and Tabulation
- Sample and Sampling
- Theory and Hypothesis
- Writing a Research Proposal

Recommended Books:


Course Objectives:
Aims to introduce the students to different themes related to Disaster Response and Recovery. The course also aims to provide fundamental knowledge of Project Cycle Management and to introduce students the wide range of key tools that support effective project cycle management.

Course Contents:
- Overview of Response to Disasters
  - Planning for response to natural disasters
  - Planning for response to man-made disasters
- Managing Disasters and Emergences
  - Management, Organization and Coordination
  - Needs assessment and immediate response, supplies and logistics
  - Activating Emergency Notification and Disaster Response Systems
  - Resource Mobilization and Allocation
  - Communication between Agencies
  - Sector Components
  - Crisis and conflict management
- Disaster Reporting
  - Understanding Disaster Reporting
  - Phases of Disaster Reporting (pre, during, post)
  - Risk Management Regime and Sources of Information
  - Current Trends in Reporting Disasters
  - Role of Local Media (Role & Obligations)
  - Disasters on the News Desks
  - Conflict Sensitive Reporting
  - Developing a Code of Conduct for reporting disasters
- Planning for Recovery and Resettlement
- Disaster planning and recovery issues
- Relief and Residual Relief
- Response and recovery programs (settlement, infrastructure, services and livelihood, etc)
- Institutional framework and networking
- Reconstruction
- Overview of the Project Cycle
- Disaster Recovery: Issues and Remedies
- Entitlement, equity and governance

**Recommended 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 Objectives:**
Aims to give students understanding of concepts and methodologies for disaster preparedness and response and making them capable to suggest workable plans for field case histories.

**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**
  - 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

**Recommended 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.

DM 11 Fundamentals of GIS and RS in Disaster Management Cr. H. 2+1

Course Objectives:
To provide with a background, principles and practices of GIS and RS in disasters risk management.

Course Contents:
- Concept and principles of GIS and RS,
- Historical evolution of Remote Sensing technology,
- Passive and Active Remote Sensing,
- Electromagnetic spectrum, Interactions with the Atmosphere,
- Principle of Remote Sensing and Aerial photogram Tory,
- Methods of interpretation of aerial photographs,
- Identification of important features with special reference to hazards, vulnerability, risk mapping,
- Practical Exercises of photo interpretation,
- Data models in GIS,
- Global Positioning System (GPS),
  - Use and application of GPS in Disaster management,
- Different types of Resolution
  - Spectral
  - Radiometric
  - Temporal
  - Spatial
- Raster data interpretation,
- Digitization of data, management, handling, editing,
- Spatial analysis, output and organization,
- Hazards and disasters data collection for GIS database development.

Recommended Books:

Statistical Techniques in Disaster Management

Course Objectives:
   i. To understand the nature of data in Disaster Management.
   ii. To use statistical techniques for data collection, analysis and interpretation.
   iii. To handle research data in digital format particularly the use of SPSS.

Course Contents:
   ▪ Introduction to Statistical Techniques in Disaster Management
   ▪ Statistical Concepts
   ▪ Disaster Management and the Attribute Data
   ▪ Data Collection
   ▪ Summarizing Data
   ▪ Grouping Techniques
   ▪ Measures of Central Tendency
   ▪ Measures of Dispersion
   ▪ Comparisons
   ▪ Purely Descriptive Comparisons
   ▪ Hypothesis Testing
   ▪ Inferential Explanatory Comparisons
   ▪ Probability and Non-Probability
   ▪ Relationships
   ▪ Trends
   ▪ Computer Based Statistics (SPSS16/MS Excel etc.)
   ▪ GIS Techniques in Data Analysis and Presentation

Recommended Books:
DM 01

Application of Geo-informatics in Disaster Management
Cr. H. 3

Objectives:
This course would help the students to understand the uses and application of GIS & RS technology in the field of Disaster Management.

Course Contents:
- Course introduction,
- Characteristics of Satellite Images,
  - Interpretation of satellite images,
  - Identification and demarcation of important features,
  - Mapping from Satellite Images,
- Application of GIS and RS in Disasters Forecasting and Management,
- Navigation System,
- Identification of hazard prone areas,
- Hazard mapping,
- Vulnerability mapping,
- Risk mapping,
- Lithosphere, Atmosphere, Ionization, Ionic Sphere, Coupling Model, and its application in earthquake precursors,
- Uses and applications of multi-spectral, spatial, temporal remote sensing in flood risk management,
- Landslide susceptibility mapping,
- Seismic hazard mapping,
- 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.

Recommended Books
Course Objectives:

i. To figure out the interactions in bio-sphere.
ii. To understand the Man and environment interaction.
iii. To interlink the disasters and climate change.
iv. To understand the climate change at global, regional and local levels.

Course Contents:

- Introduction to Climate Change and Disasters
- Weather and Climate
- Elements of Weather and Climate
- Global Climatic Regions
- Role of Oceans
  - Surface current, El-Nino and La-lina Effect, Carbon sink
- Earth Heat Budget System
- Hydro-meteorological System
- Causes of Climate Change
  - Natural and Anthropogenic
- Climate Change
- Global Warming
- Extreme Weather Events
- Climate Change and Extreme Hydro-meteorological Events
- Hydro-meteorology Disasters
- Global Distribution of Hydro-meteorological Disasters
- Impacts of Climate Change
- Climate Change and Vulnerabilities
- Climate Change Mitigation
- Climate Change Adaptations

Recommended Books:

Course Objectives:

i. To understand the relationship between climate change adaptations and disaster mitigations.

ii. To have full comprehension of the activities of all stakeholders working for climate change adaptation and disaster management in Pakistan.

Course Contents:

- Introduction to climate change adaptations and disaster mitigations in Pakistan.
- Irrigation to combat aridity.
- Floods and its mitigation.
- Desertification and its mitigation.
- Drought and its mitigation.
- Landslide and its mitigation.
- Glaciers outburst and associated hazards management.
- Water shortage and its solutions.
- Government and public sector stakeholders.
- NGOs and community participation.
- Interlinking climate change adaptations and disaster mitigation.
- Mainstreaming climate change adaptation and disaster mitigation.
- Forecasting of hydro-meteorological hazards.
- Tools for Climate Change Adaptation

Recommended Books:


Course Objectives:

i. To understand the concept of desertification.

ii. To know the causes and impacts of desertification on agro-based economy.
To enable the students to cope with desertification problem in their regions.

**Course Contents:**
- Introduction to Desertification Hazard Management
- The Concept of Desertification
- The Geomorphic Processes of Wind, Water and Glacier Erosion
- Man and Environment Relation
- Overuse of Resources
- Deforestation and Desertification
- Aridity and Irrigation
- Waterlogging and Salinity
- Impacts of Desertification on Agro-based Economy
- Mitigation Measures for Desertification
- Institutions, NGOs, Community Role in Mitigation the Risk of Soil Fertility
- Case Studies of the Arid and Waterlogged Region

**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 Objectives:**
1. To understand various issues created by disasters and inappropriate disaster management in developing and emerging economies like Pakistan.
2. To enable the students for financial allocation made for disaster management and actual economic costs of natural hazards and disasters in Pakistan.

**Course Contents:**
- Economic Resilience to Natural and Man-made disasters
- Disaster Management in the economic perspective of governance
- Resource allocations to DRR and its critical evaluation
• Impacts of disasters on Balance of Trade of Pakistan
• Impacts of disasters on economic growth of Pakistan
• Mainstreaming of Disaster Management into Economic Policies 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
• Poverty eradication and sustainable livelihoods
• Demand and Supply of Development Finance
• Poverty Alleviation and Sustainable Livelihoods

Recommended Books:

Course Objectives:

i. To enhance the policy analysis skills of the students.
ii. To understand the disaster management framework and legislations in Pakistan in the context of global conventions.

Course Contents:

• National Platforms for DRR
  o Definition, Need, Objectives, Principles, Composition, Major functions
• Guiding principles for policy
• Process of policy formulation, implementation and techniques in policy analysis
• Organizations with overall Disaster Management Responsibilities in Pakistan’s public sector
• Disaster Management and National Plans
• Disaster Management in Regional Bodies
• Legislation for Disaster Management
  o Disaster Management Act 2010
  o ERRA Act 2011
  o Civil Defence Act, 1952
  o The National Calamities Act (West Pakistan Calamities Act), 1958
  o Local Government Ordinance, 2001
  o Emergency Services Ordinance, 2002
  o Environment Legislation
    ▪ Pakistan Environmental Protection Act, 1997
    ▪ Karachi Port Trust (Amendment) Ordinance, 1994
    ▪ National Fund for Cultural Heritage Act, 1994
    ▪ Agricultural Pesticides (Second Amendment) Ordinance, 1995
    ▪ AJK Environmental Protection Act, 1996
    ▪ Federal Environmental Rules and Regulations
  o National Disaster Management Ordinance – 2006
• Analytical review of the international policies and frameworks
  o Yokohama Strategy
  o The Geneva Mandate
  o Kyoto Protocol
  o Hyogo Framework for Action (HFA)

Recommended Books:
Course Objectives:
Aims to introduce the students to different disaster risk and vulnerabilities assessment and making them proficient in making such assessments for different types of disasters related to Pakistan. The students will be trained through field visits while asking them to prepare their own risk and vulnerabilities assessments for disaster prone areas.

Course Contents:
- 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)
- Risk perception
  - Theories of Risk Perception
  - Underlying factors for Risk Perception
  - Biases of Risk Perception
- Types, magnitude and frequency relationship
  - Risk and uncertainty
  - Certainty and probability
  - Hazard prediction - trend projection
  - Hazard prediction -magnitude/frequency analysis
  - Catastrophes
- Vulnerability and Capacity Assessment (VCA)
  - VCA; Concepts and Definition
  - Purpose of VCA
  - Process of VCA
  - Outcome of a VCA
  - Community Based VCA
  - Disasters and vulnerability
  - Disasters and development
- Formulation of Spatial Data (GIS)
  - 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
- Spatial Analysis
- Hazard/ Risk mapping
  - 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
- Community Hazard Mapping
  - Need for Community Hazard Mapping
  - Process/ Methodologies
  - Community Threat
  - Scientific Information

**Recommended Books:**
3. **HANDBOOK: International Federation of Red Cross and Red Crescent Societies.** What is VCA? An introduction to vulnerability and capacity assessment.
DM 08 Disaster Risk Financing Cr. H. 3

Course Objectives:
1. To provide a clear picture of the benefits of investment in Disaster Risk Reduction.
2. To understand the tools and techniques used for disaster risk financing.
3. To gain hands on knowledge of disaster risk financing.

Course Contents:
- Significance of Disaster Risk Financing
- Inter-regional disaster risk financing mechanisms
- Fiscal disaster risk financing mechanisms at the country level
- The role of public-private partnerships in disaster insurance
- Cost – Benefit Analysis of Disaster Risk Financing
- Risk Transfer and Finance
- Risk Financing Instruments
- Micro Credit in DRR
- The role of private disaster insurance in disaster risk financing
- Financial Arrangement for Disaster Management in Pakistan
  - Prime Minister’s Disaster Relief Fund
  - Risk Mitigation Fund
  - Drought Emergency Relief Assistance

Recommended Books:
Course Objectives:

i. To understand the process of urbanization, its causes and impacts
ii. To have knowledge of urban disasters, urban slum and squatter settlement
iii. To have ability to cope with the risk of urban disasters

Course Contents:

- Introduction to Disasters Risk and Urbanization
- City Structure
- Population distribution in city and social classes
- Pattern of Urbanization in Developed and Developing Countries
- Urbanization (Definition, Causes, Impacts)
- Population distribution in city and social classes
- Problems of Urbanization
- 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, Emergency services etc.
  - Geology, hydrology, drainage, soil etc.
- Risk Reduction Measures.
  - Improvement of civic services.
  - Emergency response mechanism.
  - Hazard specific measures.

Recommended Books:

**DM 10 Management of Drought Hazard Cr. H. 3**

**Course Objectives:**
To understand the nature, causes, consequences and remedies of the drought hazard.

**Course Contents:**
- Introduction to Drought Hazard Management
- Climatic Variables Distribution
- Arid and Semi-Arid Regions
- Man and Environment Dynamic Relationship
- Eco-System and Food Chain
- Threshold Population
- Drought (Definition, Perception and Variability from Region to Region)
- Types of Drought
- Causes of Drought
- Symptoms of Drought
- Consequences of Drought
- Impacts of Drought
- Mitigation Measures for Drought
- Sustainable Use of Resources
- Key Stakeholders in Drought Management
- Community Based Drought Mitigation
- Case Studies from Pakistan

**Recommended Books:**

**DM 11 Management of Earthquake Hazard Cr. H. 3**

**Course Objectives:**
To understand the nature, causes, consequences and remedies of the earthquake hazard.

**Course Contents:**
- Introduction to Earthquake Seismology
- Plate Tectonic and Elastic Rebound Theory
Global Distribution of Earthquakes  
Folding, Faulting and Fault Lines  
Earthquake Hazard and Vulnerabilities  
Earthquake and Associated Secondary Hazards  
Seismic Zonation and Micro-Zonation  
Quantification of Earthquake Hazards  
Earthquake Hazard Reduction Measures (Structural and Non-Structural)  
Structure, Design and Material of the Buildings, Dams, Electrical Communication, Transportation etc.  
Preparedness (Individual, Family, Community, Early Warning System, Institutions, Awareness etc.)  
Increasing the Capacities and Decreasing the Vulnerabilities  
Response  
Retrofitting Techniques  
Earthquake Risk Analysis

Recommended Books:

Course Objectives:
i. To identify the positive role of economics in achieving disaster risk reduction.
ii. To understand & use the tools and techniques for the proper assessment of disaster damages.

Course Contents:
- Understanding the economic and financial impacts of disasters
- Economic Impacts of Disasters in Pakistan
- Nature of Economic Aid after Disasters
- Macro-economic impacts of disaster
- Micro-economic Impacts of Disasters
- Insurance Against Disaster Losses
• Financial and economic tools
• Effects of Disasters on Capital Accumulation
• Economic Resilience to Disasters
• Public Finance and 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.

**Recommended Books:**

**DM 13**  
**EIA and Risk Assessment**  
**Cr. H. 3**

**Course Objectives:**
1. To familiarize with the entire EIA / IEE processes for minimising occurrences of natural vs man-made disasters associated with new development schemes
2. To understand EIA techniques for impacts analysis of development projects in different sectors
3. To introduce EIA obligations under the PEPA, 1997 and EIA / IEE Regulations 2000 of the Govt. of Pakistan

**Course Contents:**
- 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
- 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
- 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
- Baseline Data Collection and Impacts Predictions in EIA
- Mitigation Measures and Development of Environmental Management Plan (EMP)

**Recommended Books:**

**DM 14 Management of Flood Hazard Cr. H. 3**

**Course Objectives:**
To understand the nature, causes, consequences and remedies of the flood hazard.

**Course Contents:**
- Introduction to Flood Hazard
- General Characteristics of Flood
- Causes of Floods
• Meteorological
• Hydrological
• Anthropogenic
  ▪ Flood Intensifying Conditions
  ▪ Types of Floods (Riverine flood, Flash flood, Coastal flood, GLOF)
  ▪ Impacts of flood
  ▪ Basic Principles in Flood Hazard Assessment
  ▪ Integrated Flood Risk Management
  ▪ Flood and Development Challenges
  ▪ Flood Mitigation Measures
    o Structural (Engineering Protection)
    o Non-structural (Planning and Policies)
  ▪ Early Warning System for Floods

**Recommended Books:**

**DM 15**

**Forecasting of Hydro-Meteorological Hazards**

**Course Objectives:**
1. To understand the causes, consequences and impacts of hydro-meteorological hazards.
2. To learn the forecasting techniques of hydro-meteorological hazards.

**Course Contents:**
- Introduction to the forecasting of hydro-meteorological hazards.
- Meteorology
- Vertical and horizontal distribution of temperature and pressure.
- Types of clouds and precipitation.
- Measuring instruments.
- Weather phenomenon
- Weather forecast and tools
- Physiography Meteorology and Hydrology
- Types of hydro-meteorological hazards.
- Basic elements of hydro-meteorological hazards (Intensity, density, exposed population and property)
- Measuring and presentation of the hydro-meteorological hazards (Scale, level and end user).
- Use of modern technology.
- Major stakeholders (Government, public and international institutions).
- Forecasting of hydro-meteorological hazards.
- Early warning system for different hazards.

**Recommended Books:**


**Course Objective:**

To know the impacts of disaster on women and to study the contribution of women in disaster management.

**Course Contents:**

- Gender and gender relations in disasters
- Women in society
- Perspective of gender: A missing element in disaster
- Gender inequality, vulnerability and disaster
- Gender Specific Needs and Issues
- Differential impact of disaster on women in different life cycle stages
- Role of women in disaster management
- Women involvement in reconstruction and development phase following an emergency and/or disaster
- Psychosocial considerations: prevention, mitigation and preparedness
- Community mobilization through women
- Case studies of women responding to disaster
- Gender Equality and Human Development Outcomes: Enhancing Capabilities
- Case Studies
Recommended Books:

DM 17 Geomorphology and Natural Hazards Cr. H. 3

Course Objectives:
   i. To know the relationship between geomorphic processes and natural hazards.
   ii. To understand the role of the man in the modification of the environment.
   iii. To apply the geomorphic techniques in the study of natural hazards.

Course Contents:
   - Introduction to Geomorphology (Scope and Importance, Geomorphology and Environment, Geomorphic Change and Man)
   - Geomorphic Processes
   - Classification of Geomorphic Processes
   - Monitoring Geomorphological Changes in the Environment
   - Endogenous Hazards
     - Earthquakes
     - Volcanism
   - Exogenous Hazards
     - Rivers and Flood Plains and Flooding
     - Drought
     - Glacial and Associated Hazards
     - Soil Erosion by Water and Wind
     - Weathering, Causes, Implication
     - Desertification, Causes and Implication
     - Mass Movement Hazards
   - Mapping Geomorphology
   - Techniques of Geomorphological Mapping
Recommended Books:
5. CROUHY, Michel; Galai, Dan; Mark, Robert; (2005) The Essentials of Risk Management. The McGraw-Hill Co., US.

Hazard Mapping

Course Objectives:
1. To know the hazard mapping.
2. To learn 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
GIS Software and Hazards Mapping

Recommended Books:
1. BOBROWSKY, Peter T. (2001) Geo-Environmental Mapping: Methods, Theory and Practice. Taylor and Francis,

Impacts of Climate Change and Disasters in Pakistan
Cr. H. 3

Course Objectives:
i. To know causes and impacts of climate change.
ii. To understand the consequences of climate change impacts and disasters.
iii. To have knowledge of the role of Pakistan in climate change and its impacts on country’s economy.

Course Contents:
- Introduction to impacts of climate change and disasters in Pakistan
- Indicators of climate change
- Causes of climate change.
- Extreme natural events and climate change
- Industrialisation, deforestation and environmental hazards
- Causes vs. impacts in global perspective
- Pakistan role in climate change
- Impacts of climate change in Pakistan
- Climate change and hazards vulnerabilities in Pakistan
- Agro-based economy and hydro-meteorological disasters
- Climate Change Policy of Pakistan
- Case Studies

Recommended Books:
Course Objectives:
To understand the nature, causes, consequences and remedies of the landslide hazard.

Course Contents:
- Introduction to Landslide Hazard Management
- Mass-Movement and Landslide
- Factors Responsible for Triggering the Landslides
- Inventory of the Landslide Hazards
- Classification of Landslides
- Slope Stability and Instability and their Classification
- Elements at Risk
- Landslide Risk Assessment
- Community Based Landslide Hazard Management
- Slope Stabilization
  - Engineering Methods
  - Bio-Engineering Methods
  - Soil Bio-Engineering Methods
- Preparedness (Community, Institutions, Awareness, Projects, Early Warning System etc.)
- Case Studies from Pakistan

Recommended Books:
Course Objectives:

i. To focus on the interdependence of disasters and livelihoods.

ii. To open up ward causal impact relationships between disasters and livelihoods.

iii. To explore the strategies for the adaptation of sustainable positive relation between disasters and livelihoods.

Course Contents:

- Introduction to Livelihood Assets
- The sustainable livelihood framework
- 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 of and through livelihoods
- Supply chains and natural hazards
- Vulnerable livelihoods and risk factors
- Best Practices in Livelihoods

Recommended Books:


Disaster Planning and Management in Pakistan

Course Objectives:

i. To understand various hazards and disasters occurring in Pakistan.

ii. To know the importance and relevance of mechanisms for preparedness and management of disastrous situation in the context of Pakistan.

iii. To provide full comprehension of the disaster planning cycle, including disaster risk reduction, early warning and management of recovery process.

Course Contents:

- Introduction to Planning for Disaster Management
- Significance of disaster planning and management
- Physical feature and climate of Pakistan
- Risk and vulnerability to hazards and disasters in Pakistan
- Basic concept of Disaster Management Cycle i.e. prevention, mitigation, preparedness, disaster impact, response, recovery and development
- Awareness and preparedness to natural hazards and disasters in the country;
- Vulnerability analysis
- National Disaster Management Policy
- Major requirements for coping with disasters i.e. Organization, Planning and Training needs
- Modern challenges and Disaster management
- Damage assessment, evacuation, rehabilitation and recovery
- Formulation of Disaster Management Plan
- Existing Institutions and Hazard-Reduction Policies in Pakistan
- Natural Hazards Risk and National Development

Recommended Books:

Psychological Impacts of Disaster and its Management

Course Objectives:
To understand the psychological impacts of disasters and their remedies.

Course Contents:
- Trauma response
  - Normal response, Basic principle, Bio psychosocial model, cultural influences.
- Classification of Psychological Disorders
  - Depression, Anxiety, Post-traumatic stress disorder.
- Children in Disasters
  - Development tasks, risk factors, and childhood traumatic grief.
- Psychological support
  - Psychological first aid, coping strategies, and resiliency models.
- Community Mental health program

Recommended Books:

Sociology of Disasters

Course Objective:
- To provide students with a framework for thinking about disasters in sociological terms and events.
- To provide understanding of special sociological issues such as race, class, gender and family in disaster.

Course Contents:
- Sociology and the Study of Disaster
- Social System Ecological Networks and Disaster
- Sociological Perspective on Disaster
- Role of Faith, Belief and Religion in Disasters
- Myths, Realities and Cultural Representation of Disaster
- Behavioural Response to Disaster
- Community Impact of Disaster
- Social Capital and Disaster
- Social Vulnerability and Theories of Social Vulnerability
- Disaster, Race and Social Class
- Gender and Disaster
- Children and Disaster
- Elderly and Disaster
- Consequences of Post disaster relocation and prospects for recovery
- Disaster, language barrier and disabilities
- Disaster and social change

**Recommended Books:**

**DM 25 Media and Disaster Management Cr. H. 3**

**Course Objectives:**
- To understand the role of various basic disciplines of engineering
- Role of various engineering codes, guidelines and specifications
- History of disasters with specific emphasis to Pakistan in context of engineering

**Course Contents:**
- Disasters and the media in a global age
- The geopolitics of disaster coverage
- Making disasters mean and politically matter
- The making of a newsroom and news editing
- Disaster citizenship and assumption of state responsibility
- Accountability of disaster news: ethics of disaster reporting
- Social media and disaster
  - The evolution of use of social media in disasters
  - Using social media as one part of comprehensive disaster communication programme
  - Future trends in the use of digital media and its challenges
- Essentials of successful disaster communication
- Learning the application of communication principles in different phases of disasters
- Understanding disaster communications audience
Managing media relations as a disaster manager
Building an effective plan, strategy and skill for disaster communication in a changing media world
Terrorism communication challenges
Understanding the role of partners/stakeholders in disaster communication
Class project: Learning best practices of the use of media in disasters through Case studies of successful and failed disaster communication

Recommended Books:

DPM 26
Contingency Planning in Disaster Management
Cr. H. 3

Course Objectives:
i. To understand the role of various basic disciplines of engineering
ii. Role of various engineering codes, guidelines and specifications
iii. History of disasters with specific emphasis to Pakistan in context of engineering

Course Contents:
- Introduction to contingency Planning
- Preparedness: Organization. Training, Planning and/or Plans
- 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. 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
Recommended Books:

RECOMMENDATIONS BY NCRC FOR THE IMPLEMENTATION OF BS/MS DISASTER MANAGEMENT

1. Recognition of DM Programme
   1.1. Recognition of Disaster Management as a science subject by the HEC and other National bodies.
   1.2. Disaster Management must be treated at par with other basic sciences by the HEC.
   1.3. Opening of Disaster Management Departments in all general public and private sector universities of the country.
   1.4. Facilitate curricula development at School and College levels through relevant bodies.
   1.5. The broad spectral domain of Disaster Management provides an opportunity for a wide range of useful multi-disciplinary associations with other subject areas. Therefore, HEC is to advise the institutions to provide maximum range of combinations both with BS science and humanities groups.

2. Labs/Equipment
   2.1. Provision of computers for Disaster Management labs. There should be Central Computer lab in each institution/colleges to provide computing facility to the different disciplines of sciences including Disaster Management. The GIS and Remote Sensing software should be provided at least to the post graduate level institution where Disaster Management is taught.
   2.2. Sufficient funds should be allocated by the Institutions for the purchase of teaching aids, surveying and computing equipment/instruments, GPS and other field surveys equipment.
3. **Workshops/Seminars/Conferences**
   3.1. National level workshop should be organized by HEC to discuss the problems related to the implementation for 4 year BS and 2 year MS Disaster Management curriculum at the national level.
   3.2. Workshops/seminars/conferences should be arranged at regular interval for the capacity building of all stakeholders related to disaster management.
   3.3. Facilitating knowledge sharing through workshops, seminars and conferences among scientific community.

4. **Library Facilities**
   4.1. Development of well-equipped seminar libraries and provision of funds for appropriate collection of journals, literature and reference material including government publications.
   4.2. HEC to facilitate publication of monographs, reports and books in Disaster Management.
   4.3. HEC to provide robust, internet facility for access to online journals, e-books, reports, satellite data and video streaming.

5. **Research Support**
   HEC to provide adequate funds for field works/research works related to Disaster Management to the institutions.

6. **Refresher Courses**
   6.1. Organizing refresher courses regularly for postgraduate teachers in collaboration with NDMA, PDMAs, RESCUE 1122, Survey of Pakistan, Meteorological Department of Pakistan, Geological Survey of Pakistan, and SUPARCO etc. related to Instrumental Surveying, GIS, Remote Sensing, Emergency Response Management, Disaster Risk Assessment etc.
   6.2. Refresher courses should be arranged at regular intervals for all teachers (Disaster Management) to keep them abreast with continuing changes in the discipline in the given fields.
   6.3. The HEC may advise subordinate institutions to run short-term courses during summer vacation within the ramifications of disaster management enabling disaster management teachers to enhance their knowledge.
COMPULSORY COURSES IN ENGLISH FOR BS
(4 YEAR) IN BASIC & SOCIAL SCIENCES

English I (Functional English)

Objectives: Enhance language skills and develop critical thinking.

Course Contents:

Basics of Grammar
Parts of speech and use of articles
Sentence structure, active and passive voice
Practice in unified sentence
Analysis of phrase, clause and sentence structure
Transitive and intransitive verbs
Punctuation and spelling

Comprehension
Answers to questions on a given text

Discussion
General topics and every-day conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students)

Listening
To be improved by showing documentaries/films carefully selected by subject teachers

Translation skills
Urdu to English

Paragraph writing
Topics to be chosen at the discretion of the teacher

Presentation skills
Introduction

Note: Extensive reading is required for vocabulary building

Recommended Books:

1. Functional English
   a) Grammar
English II (Communication Skills)

Objectives: Enable the students to meet their real life communication needs.

Course Contents:

Paragraph writing
Practice in writing a good, unified and coherent paragraph

Essay writing
Introduction

CV and job application
Translation skills
Urdu to English

Study skills
Skimming and scanning, intensive and extensive, and speed reading, summary and précis writing and comprehension

Academic skills
Letter/memo writing, minutes of meetings, use of library and internet

Presentation skills
Personality development (emphasis on content, style and pronunciation)

Note: documentaries to be shown for discussion and review

Recommended Books:

Communication Skills

Grammar
b) Writing

c) Reading
2. Reading and Study Skills by John Langan

English III (Technical Writing and Presentation Skills)

Objectives: Enhance language skills and develop critical thinking

Course Contents:

Presentation skills

Essay writing
Descriptive, narrative, discursive, argumentative

Academic writing
How to write a proposal for research paper/term paper
How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency)

Technical Report writing
Progress report writing

Note: Extensive reading is required for vocabulary building

Recommended Books:

Technical Writing and Presentation Skills

a) Essay Writing and Academic Writing

b) Presentation Skills
c) Reading
The Mercury Reader. A Custom Publication. Compiled by northern Illinois University. General Editors: Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton. (A reader which will give students exposure to the best of twentieth century literature, without taxing the taste of engineering students).
Introduction/Objectives:

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Outline:

1. Historical Perspective
   b. Factors leading to Muslim separatism
   c. People and Land
      i. Indus Civilization
      ii. Muslim advent
      iii. Location and geo-physical features.

2. Government and Politics in Pakistan
   Political and constitutional phases:
   a. 1947-58
   b. 1958-71
   c. 1971-77
   d. 1977-88
   e. 1988-99
   f. 1999 onward

3. Contemporary Pakistan
   a. Economic institutions and issues
   b. Society and social structure
   c. Ethnicity
   d. Foreign policy of Pakistan and challenges
   e. Futuristic outlook of Pakistan

Recommended Books:


ISLAMIC STUDIES
(Compulsory)

Objectives:

This course is aimed at:
1. To provide Basic information about Islamic Studies
2. To enhance understanding of the students regarding Islamic Civilization
3. To improve Students skill to perform prayers and other worships
4. To enhance the skill of the students for understanding of issues related to faith and religious life.

Detail of Courses:

Introduction to Quran Studies
1) Basic Concepts of Quran
2) History of Quran
3) Uloom-ul -Quran

Study of Selected Text of Holly Quran
1) Verses of Surah Al-Baqra Related to Faith (Verse No-284-286)
2) Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
3) Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
4) Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
5) Verses of Surah Al-Inam Related to Ihkam(Verse No-152-154)

Study of Selected Text of Holly Quran
1) Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
2) Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
3) Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No-1,14)

Seerat of Holy Prophet (S.A.W) I
1) Life of Muhammad Bin Abdullah ( Before Prophet Hood)
2) Life of Holy Prophet (S.A.W) in Makkah
3) Important Lessons Derived from the life of Holy Prophet in Makkah

Seerat of Holy Prophet (S.A.W) II
1) Life of Holy Prophet (S.A.W) in Madina
2) Important Events of Life Holy Prophet in Madina
3) Important Lessons Derived from the life of Holy Prophet in Madina
Introduction To Sunnah
1) Basic Concepts of Hadith
2) History of Hadith
3) Kinds of Hadith
4) Uloom-ul-Hadith
5) Sunnah & Hadith
6) Legal Position of Sunnah

Selected Study from Text of Hadith

Introduction To Islamic Law & Jurisprudence
1) Basic Concepts of Islamic Law & Jurisprudence
2) History & Importance of Islamic Law & Jurisprudence
3) Sources of Islamic Law & Jurisprudence
4) Nature of Differences in Islamic Law
5) Islam and Sectarianism

Islamic Culture & Civilization
1) Basic Concepts of Islamic Culture & Civilization
2) Historical Development of Islamic Culture & Civilization
3) Characteristics of Islamic Culture & Civilization
4) Islamic Culture & Civilization and Contemporary Issues

Islam & Science
1) Basic Concepts of Islam & Science
2) Contributions of Muslims in the Development of Science
3) Quran & Science

Islamic Economic System
1) Basic Concepts of Islamic Economic System
2) Means of Distribution of wealth in Islamic Economics
3) Islamic Concept of Riba
4) Islamic Ways of Trade & Commerce

Political System of Islam
1) Basic Concepts of Islamic Political System
2) Islamic Concept of Sovereignty
3) Basic Institutions of Govt. in Islam

Islamic History
1) Period of Khlaft-E-Rashida
2) Period of Ummayyads
3) Period of Abbasids

Social System of Islam
1) Basic Concepts Of Social System Of Islam
2) Elements Of Family
3) Ethical Values Of Islam

Reference Books:
1) Hameed ullah Muhammad, “Emergence of Islam”, IRI, Islamabad
2) Hameed ullah Muhammad, “Muslim Conduct of State”
3) Hameed ullah Muhammad, ‘Introduction to Islam
4) Mulana Muhammad Yousaf Islahi,”
6) Ahmad Hasan, “Principles of Islamic Jurisprudence” Islamic Research Institute, International Islamic University, Islamabad (1993)
9) Dr. Muhammad Zia-ul-Haq, “Introduction to Al Sharia Al Islamia” Allama Iqbal Open University, Islamabad (2001)
Annexure “D”

COMPULSORY MATHEMATICS COURSES FOR BS (4 YEAR)

(FOR STUDENTS NOT MAJORING IN MATHEMATICS)

1. MATHEMATICS I (ALGEBRA)

Prerequisite(s): Mathematics at secondary level
Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of algebra to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions.
Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer’s rule.

Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations.

Sequences and Series: Arithmetic progression, geometric progression, harmonic progression.

Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices.

Trigonometry: Fundamentals of trigonometry, trigonometric identities.

Recommended Books:
Dolciani MP, Wooton W, Beckenback EF, Sharron S, Algebra 2 and Trigonometry, 1978, Houghton & Mifflin,

Kaufmann JE, College Algebra and Trigonometry, 1987, PWS-Kent Company, Boston
Statistics-I

Definition and importance of Statistics in Agriculture, Data Different types of data and variables
Classification and Tabulation of data, Frequency distribution, stem-and-Leaf diagram, Graphical representation of data Histogram, frequency polygon, frequency curve.
Measure of Central tendency, Definition and calculation of Arithmetic mean, Geometric mean, Harmonic mean, Median quantiles and Mode in grouped and un-grouped data.
Measure of Dispersion, Definition and Calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation.

Practical:
  a. Frequency Distribution  
  b. Stem-and-Leaf diagram  
  c. Various types of Graphs  
  d. Mean, Geometric mean Harmonic Mean,  
  e. Median, Quartiles Deviation, mean Deviation.  
  f. Standard Deviation, Variance, Coefficient of variation,  
  g. Skewness and kenosis

Recommended Books:
1. Introduction to Statistical Theory Part- I by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)  
2. Statistical Methods and Data Analysis by Dr. Faquir Muhammad  
Statistics-II

Sampling Probability and non-Probability Sampling, Simple random sampling stratified random sampling Systematic sampling error, Sampling distribution of mean and difference between two means. Interference Theory: Estimation and testing of hypothesis, Type—I and type-II error, Testing of hypothesis about mean and difference between two means using Z-test and t-test, Paired t-test, Test of association of attributes using X2 (chi-square) Testing hypothesis about variance.

Practical:

a. Sampling random sampling
b. Stratified random sampling.
c. Sampling distribution of mean
d. Testing of hypotheses regarding population mean
e. Testing of hypotheses about the difference between population means
f. Chi-square test
g. Testing of Correlation Coefficient
h. Fitting of simple linear regression
i. One-way ANOVA
j. Two-way ANOVA

Recommended Books:

1. Introduction to Statistical Theory Part-II by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)
2. Statistical Methods and Data Analysis by Dr. Faquir Muhammad
INTRODUCTION TO INFORMATION AND COMMUNICATION TECHNOLOGIES

Course Structure: Lectures: 2 Labs: 1 Credit Hours: 3
Pre-requisite: None Semester: 1

Course Description:

This is an introductory course on Information and Communication Technologies. Topics include ICT terminologies, hardware and software components, the internet and World Wide Web, and ICT based applications. After completing this course, a student will be able to:

- Understand different terms associated with ICT
- Identify various components of a computer system
- Identify the various categories of software and their usage
- Define the basic terms associated with communications and networking
- Understand different terms associated with the Internet and World Wide Web.
- Use various web tools including Web Browsers, E-mail clients and search utilities.
- Use text processing, spreadsheets and presentation tools
- Understand the enabling/pervasive features of ICT

Course Contents:

Basic Definitions & Concepts
Hardware: Computer Systems & Components
Storage Devices, Number Systems
Software: Operating Systems, Programming and Application Software
Introduction to Programming, Databases and Information Systems
Networks
Data Communication
The Internet, Browsers and Search Engines
The Internet: Email, Collaborative Computing and Social Networking
The Internet: E-Commerce
IT Security and other issues
Project Week
Review Week
Text Books/Reference Books: