



Mehran University of Engineering and Technology, Jamshoro
Department of Civil Engineering

Title of Subject	:	<u>Surveying-I (Th + Pr)</u>
Code	:	CE112
Discipline	:	Civil Engineering (2 nd Semester)
Effective	:	20-Batch and Onwards
Pre-requisite	:	Nil Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination
Credit Hours	:	02 + 01 Marks : 50 + 50
Minimum Contact Hours:	:	30 + 45

Course Learning Outcomes (CLOs):

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

CLO	Description	Taxonomy Level	PLO
1	DISCUSS various survey equipment and techniques to be used for linear and angular measurements and for computing the areas of plots.	C2	1
2	PREPARE the L-section and X-section using the computations of levels.	C3	2
3	EXECUTE various surveying instruments used for linear and angular measurements.	P4	5

Course outline:

- **Introduction**
Introduction to Surveying, Classification of surveying.
- **Measurement of Distance**
Various methods of measuring distance, Instruments for measuring distance and marking stations, Ranging out survey lines, Chaining on sloping ground.
- **Chain Surveying**
Introduction to Chain Surveying, Offset and its types, Obstacles in Chain Surveying, Layout by Offset Method.
- **Traverse Survey**
Traverse, types of traverse, Bearing and designation of bearings, Local attraction, magnetic declination, Equipment used for finding Bearings, Computation of Bearings and Angles.
- **Levelling**
Definition, principles, classification of levelling, Types of levels and their temporary and permanent adjustments, Booking and reduction of levels, Profile and cross-section levelling, contouring.
- **Computation of Areas and Volume**
Computation of areas by using mid-ordinate rule, average ordinate rule, trapezoidal and Simpson rule, Computation of areas by co-ordinates, Computation of volume by trapezoidal and end area method.
- **Surveying Drafting**



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Plotting Profiles, Cross Sections, Plans and Contours.

Practical Work to be carried out:

1. a). Introduction to Health and Safety measures in Surveying Lab.
b). Introduction to various Surveying Instruments.
2. To range out a survey line when the two ends of a line are inter-visible from each end.
3. To measure the horizontal distance between two terminal stations by different methods. (Pacing, Measuring Tape and Chain).
4. To range out a survey line and mark the intermediate points when two ends of lines are not inter-visible from each end. (Indirect Ranging).
5. To determine the horizontal distance between the two terminal stations on a sloping ground by (i). Stepping Method. (ii). Using Abney Level
6. To set out the base line and Perpendicular lines / Offsets in the field.
7. Layout of rooms of a house by offset method using Pythagoras Theorem.
8. Introduction to Automatic Level and Temporary Adjustment of an Automatic Level.
9. To determine the Staff Readings at different points on the natural ground by Auto Level.
10. To determine the reduced level of an existing Road-Profile Levelling.
11. To collect data for cross sectional levelling of a proposed road using Auto Level.
12. To draw Profile of a Road (L-section) from the obtained level data.
13. To draw Cross sections of a proposed road from obtained level data.
14. To determine area of an irregular boundary by Simpson's Rule.
15. To perform an open-ended lab.

Recommended Books:

- Plane Surveying, Dr A M Chandra, Latest Edition
- Surveying Vol: (I + II), B.C Punmia, Latest Edition
- Surveying Practice, Jerry. A. Nothanson and Philip Kissam, Latest Edition

Approval:

Board of Studies:

Resolution No. 32.3

Dated: 03-10-2020

Board of Faculty:

Resolution No. 20.11

Dated: 07-10-2020

Academic Council:

Resolution No. 98.7(ii)

Dated: 22-10-2020



Mehran University of Engineering and Technology, Jamshoro
Department of Civil Engineering

Title of Subject	:	<u>Civil Engineering Drawing (Th + Pr)</u>
Code	:	CE122
Discipline	:	Civil Engineering (2 nd Semester)
Effective	:	20-Batch and onwards
Pre-requisite	:	Geometrical Drawing Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination
Credit Hours	:	02 + 01 Marks : 50 + 50
Minimum Contact Hours:	:	30 + 45

Course Learning Outcomes (CLOs):

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

CLO	Description	Taxonomy Level	PLO
1	PREPARE plans, elevations and sections of various civil engineering works.	C3	1
2	ILLUSTRATE Electrical and Plumbing drawings.	C3	1
3	MAKE drawings of civil engineering works using modern tools.	P4	5

Course outline:

● **Introduction**

Need and requirement of drawings for civil engineering works, General nature of drawings, Components, symbols and nomenclature needed for specific drawings such as architectural, plumbing, electrical, roads and earthwork, Drawing at various stages of works.

● **Architectural Drawing**

Elements of architectural planning and design, Schematic and working drawings and details of residential, commercial, religious, recreational, industrial, clinical, hospital and educational buildings, Working drawings of Foundation, Beam and Column, Details of doors, windows and staircases.

Practical work to be carried out:

1. To know about different tools used in Civil Engineering Drawing and introduction of HSE measures.
2. To draw plan, elevation and section of one room.
3. To draw plan, elevation and section of two room with verandah.
4. To draw the plan, elevation and cross section of Beam and column.
5. To draw the plan and elevation of different types of stairs.
6. Introduction to AutoCAD software and to know about UNITS and DIMENSIONS in AutoCAD.
7. To know the procedure and usage of different commands of DRAW, PROPERTIES, INQUIRY and DIMENSION toll bar.
8. To know the procedure and usage of different commands of MODIFAY and LAYER toll bar.
9. To draw irregular closed figure and calculate its area and perimeter in AutoCAD.
10. To draw the architect plan, elevation and cross section of single room and double room with verandah in AutoCAD.
11. To draw the architect plan and layout of bungalow in AutoCAD.



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12. To draw the plan, elevation and cross section of isolated column with footing and plinth beam in AutoCAD.
13. To draw the plan of half turn staircase in AutoCAD.
14. To draw the plumbing plan of house in Auto CAD.
15. To Perform an open-ended lab.

Recommended Books:

- Civil Engineering Drawing, M. Chakraborti, Malik Book Depot, Lahore, Latest Edition
- Civil Engineering Drawing, Gurcharan Singh, Malik Book Depot, Lahore, Latest Edition
- Introduction to AutoCAD® 2016 2D and 3D Design, Berned S Palm and Alf Yarwood, AutoDesk, Latest Edition

Approval:

Board of Studies:

Board of Faculty:

Academic Council:

Resolution No. 32.3

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Dated: 03-10-2020

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Dated: 22-10-2020



Mehran University of Engineering and Technology, Jamshoro
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Title of Subject	:	<u>Engineering Geology (Th + Pr)</u>	
Code	:	CE125	
Discipline	:	Civil Engineering (2 nd Semester)	
Effective	:	20-Batch and onwards	
Pre-requisite	:	Civil Engineering Materials	Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination	
Credit Hours	:	03 + 01	Marks : 100 + 50
Minimum Contact Hours:		45 + 45	

Course Learning Outcomes (CLOs):

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

CLO	Description	Taxonomy Level	PLO
1	IDENTIFY the minerals, rocks, and their physical properties.	C1	1
2	DISCUSS structural geology, geo-hazards, hydrogeology, tunnelling and site for the important Civil Engineering projects.	C2	1
3	MAKE drawing of cross sections and landslide models and recognize the physical and chemical properties of rocks and minerals; and folds and faults in rocks.	P4	4

Course outline:

- **Introduction**
Introduction to Geology and Engineering Geology, Engineering Geology versus Geology, Importance of Engineering Geology for Civil Engineering Projects, Geological Science and Subdivisions: Earth's Materials, Earth's Process, Earth's History, Structure and Composition of the Earth, Geological Times, Sequence and Principles of Stratigraphy.
- **Minerals and Rocks**
Introduction to Minerals and Rocks, Identification of Minerals, Crystal Form of Minerals, Rocks: Igneous, Sedimentary and Metamorphic, Rock Cycle, Rock-Forming Minerals, Physical Properties of Rocks and Minerals and Their Determination, Classification of Rocks and Minerals with Respect to Color, Hardness, Grain Size, Texture, Strength and Weathering, Identification of Common Rock Types and Their Engineering Properties: Shales, Sandstones and Limestone.
- **Structural Geology**
Introduction to Structural Geology, Dip and Strike, Folds and Their Types, Faults and their Causes, Classification of Faults with Respect to Relative Moment, Dip and Strike of Strata, Amount of Inclination, Mode of Occurrence, Joints and Their Classification, Field Interpretation of Folds Faults and Joints, Structures due to Denudation.
- **Earthquakes**
Tectonics Plates, Earthquakes and Their Causes, Measurements of Earthquakes, Protective Measures against Earthquakes, Earthquake Zoning of Pakistan.
- **Earthflows and Land Sliding**
Introduction to Earthflows and Land Sliding, Types of Earthflows: Soil Creep, Rock Creep, Solifluction and Mudflows, Causes of Earthflows, Types of Land Sliding: Slump, Rockslides and Rock Falls, Causes of Land Slides.



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- **Hydrogeology:**
Introduction to Wells, Springs, Streams, Ground Water, and Glaciers, Types of Wells, Springs, Streams, Ground Water, and Glaciers.
- **Tunnelling**
Introduction to Tunnels, Types of Tunnels, Tunnel Construction Methods in Rocks, Geological Survey Prior to Tunnelling, Lining of Tunnels and Its Sections.
- **Selection of Sites for Civil Engineering Projects**
Role of Geology in Selection of Sites for Dams, Reservoirs, Tunnels and Other Civil Engineering Projects, Such as Highways, Airfields and Bridges, Brief Introduction of Local Geology.

Practical work to be carried out:

1. Introduction to the Engineering Geology Laboratory and HSE (Health, Safety and Environment) measures
2. To determine the hardness of minerals using Moh's scale.
3. To determine the streak of minerals.
4. To determine the compressive strength of rocks using Schmitt hammer.
5. To determine the unconfined compressive strength of rocks in UTM machine.
6. To determine the tensile strength of rocks in UTM machine.
7. To determine the slake durability index (Weathering) of rocks.
8. To determine the presence of carbonates in rocks using acid test.
9. To observe the folds using sand box.
10. To observe the different types of faults using sand box.
11. To distinguish the folds and faults in rocks at site
12. To prepare the rainfall-induced landslide in landslide Physical Model.
13. To prepare the relationship between rainfall intensity and erosion using landslide physical model.
14. To prepare drawing of Cross Sections from Geological maps.
15. To perform an open-ended lab.

Recommended Books:

- A Geology for Engineers, Blyth, F.G.H, Arnold International, Latest Edition
- Geology and Engineering, Legget, R.F, McGraw Hill International, Latest Edition
- Goodman, R.E: Engineering Geology: Rock in Engineering Construction, John Wiley & Sons, Inc., Singapore, Latest Edition

Approval:

Board of Studies:

Board of Faculty:

Academic Council:

Resolution No. 32.3

Resolution No. 20.11

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Dated: 03-10-2020

Dated: 07-10-2020

Dated: 22-10-2020



Mehran University of Engineering and Technology, Jamshoro
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Title of Subject	: <u>Applied Calculus</u>		
Course Code	: MTH 108		
Discipline	: CE		
Semester	: 2 nd semester		
Effective	: 17 Batch onwards		
Pre-requisites	: Pre – Engineering		
Assessment	: 20% sessional work	Mid-sem. Exam: 20%	End-Sem Exam: 60%
Marks	: TH: 100	PR: 00	
Credit Hours	: TH: 03	PR: 00	
Min. Contact Hours	: TH: 45	PR: 00	

Course Learning Outcomes

After completion of this course the student should be able to:

CLO	Description	Taxonomy Level	PLOs
1	Determine the functions and their derivatives.	C2	1
2	Compute the Integral calculus with applications	C2	1
3	Apply the vector calculus in the field of engineering	C3	1

Assessment Methods of CLOs of Subject name

CLOS	Sessional Tests and Assignments	Mid Exam	Final Exam	Learning Levels	PLOs
CLO 1	20%	70%	10%	C2	1
CLO 2	40%	30%	30%	C2	1
CLO 3	40%	-----	60%	C3	1

Contents

Introduction to functions: Mathematical and physical meaning, graphs and types of function.

Introduction to limits: Theorems of limits and their applications to functions. Right hand and left hand limits. Continuous and discontinuous functions and their applications.

Derivatives: Introduction to derivatives. Geometrical and physical meaning of derivatives. Partial derivatives and their geometric significance. Application problems (rate of change, marginal analysis).

Higher Derivatives: Leibnitz theorem, Rolle’s theorem, Mean value theorem. Taylors and Maclaurins series.

Evaluation of limits using L’ Hospital’s rule: Indeterminate forms $(0/0)$, (∞/∞) , $(\infty\infty)$, $(\infty-\infty)$, 1^∞ , ∞^0 , 0^0 .

Application of Derivatives: Asymptotes, curvature and radius of curvature, differentials with application.

Application of partial Derivatives: Euler’s theorem, total differentials; maxima and minima of function of two variables.

Integral Calculus: Methods of integration by substitution and by parts. Integration of rational and irrational algebraic functions. Definite integrals, improper integrals. Gamma and Beta functions; reduction formulae.

Application of Integral Calculus: Cost function from marginal cost, rocket flights; area under curve.

Vector Calculus: Vector differentiation and vector integration with their physical interpretation and applications. ∇ operator, gradient, divergence and curl with their application.

Books Recommended:

- Benice, D.D., Brief calculus and its applications,
- Raymond, A.B., Applied calculus



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- Yousuf, S.M., Calculus and analytical Geometry, IlmiKitabKhana, Lahore, latest edition.

Approval:

Board of Studies: 01/2018

Res. No. 01

Dated: 26-03-2018

Board of FOST&H,

Res. No. 3.1

Dated: 11-04-2018

Academic Council:

Res. No. 17 (ii)

Dated: 23-04-2018



Mehran University of Engineering and Technology, Jamshoro
Department of Civil Engineering

Title of Subject	: <u>ISLAMIC STUDIES</u>		
Course Code	: SS 111		
Discipline	: CE		
Semester	: 2 nd semester		
Effective	: 17 Batch onwards		
Pre-requisites	: Social Science		
Assessment	: 20% sessional work	Mid-sem. Exam: 20%	End-Sem Exam: 60%
Marks	: TH: 50	PR: 00	
Credit Hours	: TH: 02	PR: 00	
Min. Contact Hours	: TH: 30	PR: 00	

Course Learning Outcomes:

On completion of this course the students should be able to:

CLO	Description	Taxonomy Level	PLOs
1	Explain scope and significance of basic beliefs & pillars of Islam, their effects on different aspects of individual life and society	C2	8
2	Enhance understanding of Quran, Hadith and life of Holy Prophet Muhammad (ﷺ) as the source of inspiration and guidance.	C2	6

Assessment Methods of CLOs of Subject name

CLOS	Sessional Tests and Assignments	Mid Exam	Final Exam	Learning Levels	PLOs
CLO 1	50%	80%	30%	C2	8
CLO 2	50%	20%	70%	C2	6

Course Contents:

Quran and Uloomul Quran: Surah Al-Hujurat., Surah Al-Furqan (These both surahs cover all topics related to ethical values of Islamic society including Taqwa, Taqwa, Simplicity, Lawful earning, Social Justice, Rights of Parents, elders, neighbors, Fear of Allah and Truthfulness), Excellence of Holy Quran (Aijazul Quran), History of collection and compilation of Holy Quran. **Basic Beliefs of Islam:** Tauheed, its importance, effects on the life of believer, shirk and its types, Existence of Angels, Holy Scriptures, Prophethood, its need and necessities, characteristics and Finality of Prophethood, Concept on life hereafter. **Life history of Holy Prophet Muhammad** (ﷺ): Life history at Makkah (Before Prophethood), Life history at Makkah (after Prophethood), Life history at Madina {including Brotherhood, Charter of Madina, Victory of Makkah and Last Sermon of Holy Prophet Muhammad (ﷺ)}, Importance of Hadith and Sunnah, Ten selected Ahadiths (Covering topics related to Proper usage of time, Hospitality, quality of shyness, love and affection to humanity, facilitate to others and tolerance etc). **Fundamentals of Islam:** Testifying Kalima Shahadah, Prayer, its importance, pre-conditions, obligations and effects, Zakat, its aims & objectives, Requirements, Legal recipients, Nisab and benefits, Fasting, its philosophy, requirements and benefits, Pilgrimage, requirements, types, obligations, procedure and benefits, Jihad and its types. **Islam and Science:** Quran and Science, Importance of science and technology in Islam, Historical contribution of Islam and Muslims in the development of science, Verses of Holy Quran those cover different fields of science e.g. social, management and natural science.

Text books :

A.A. Umrani, **Islam: The universal Religion**, Naseem book depo, latest edition.

A.Q. Natiq, **Sirat-e-Mustaqeem**, Urdu bazaar Karachi, latest edition.

Reference books:

S.M. Saeed, **Islam aur Hamari Zindagi**, Naseem book depo, latest edition.

M. Shabudden, **Quran Science and Muslims**, Al Maktabah Al Ashrafiya, Lahore, latest edition.

Approval:	Board of Studies: 01/2018	Res. No. 01	Dated: 26-03-2018
	Board of FOST&H,	Res. No. 3.1	Dated: 11-04-2018
	Academic Council:	Res. No. 17 (ii)	Dated: 23-04-2018



Mehran University of Engineering and Technology, Jamshoro
Department of Civil Engineering

Title of Subject	: Ethics (optional for only non-Muslim students)		
Course Code	: SS 104		
Discipline	: CE		
Semester	: 2 nd semester		
Effective	: 17 Batch onwards		
Pre-requisites	: Social Science		
Assessment	: 20% sessional work	Mid-sem. Exam: 20%	End-Sem Exam: 60%
Marks	: TH: 50	PR: 00	
Credit Hours	: TH: 02	PR: 00	
Min. Contact Hours	: TH: 30	PR: 00	

Course Learning Outcomes:

After completing this course student should be able to:

CLO No.	Description	Taxonomy Level	PLOs
1	Create stable and healthy civilized society.	C2	6
2	Develop uniformity of moral beliefs and behavior.	C2	8

Assessment Methods of CLOs of Subject name

CLOS	Sessional Tests and Assignments	Mid Exam	Final Exam	Learning Levels	PLOs
CLO 1	50%	70%	30%	C2	6
CLO 2	50%	20%	70%	C2	8

Course Contents:

Ethics: Definition of Ethics, Position of ethics in different religions.

Islam: Introduction, Role of Beliefs and Arakans in character building, Rights of Non-Muslim, Ill effects of corruption and respect of law.

Hinduism: Introduction, Role of doctrines in character building, Religious books, Concept of Re-Birth and its influence in social life, Celebration days and their social effects, Comparative study of cast systems in the contemporary atmosphere.

Buddhism: Introduction, Doctrines, Eight Nobel Paths of Buddha and its benefits, Critical study on concept of Renunciation of material & worldly life.

Christianity: Introduction, Doctrines, Religious books, Celebration days.

Judaism: Introduction, Doctrines, Religious books, Ten Commandments of Moses and its importance in social life.

Moral values of different religions: Patience, Modesty, Moderation, Tawakal, Taqwa, Lawful earning, Sincerity, Positivity, Forgiveness and Softening.

Bad morals: lying, pride, selfishness, Fame, Greed, Extravagantness, Bribe, Social injustice, Religious biasness and Discrimination on the basis of race, color and faith



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Text Books:

1. Dr. A Rasheed, Comparative Study of Religions Tahir sons Karachi, latest edition.
2. AadilFaraz, IkhlaiyatMazahib-e-Aalamkinazar main, ApnaIdara Lahore latest edition.

Reference Books:

1. Jeoge D. Chryssides, the study of religions – an introduction to key ideas and methods, London, latest edition.
2. GhulamRasool Cheema MazahibAalamkaMutalia, Ilm o Irfan publishers Lahore latest edition.

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	Academic Council:	Res. No. 17 (ii)	Dated: 23-04-2018



Mehran University of Engineering and Technology, Jamshoro
Department of Civil Engineering

Title of Subject	: <u>Pakistan Studies</u> (Compulsory)		
Course Code	: PS 106		
Discipline	: CE		
Semester	: 2 nd semester		
Effective	: 17 Batch onwards		
Pre-requisites	: Social Science		
Assessment	: 20% sessional work	Mid-sem. Exam: 20%	End-Sem Exam: 60%
Marks	: TH: 50	PR: 00	
Credit Hours	: TH: 02	PR: 00	
Min. Contact Hours	: TH: 30	PR: 00	

Course Learning Outcomes :After completion of this course the student should be able to

CLO	Description	Taxonomy Level	PLOs
1	Trace the Muslim Nationalism in South Asia and the creation of Pakistan	C2	6
2	Discuss the Constitutional and Political history of Pakistan and to analyze contemporary challenges to Pakistan	C2	6

Assessment Methods of CLOs of Subject name

CLOS	Sessional Tests and Assignments	Mid Exam	Final Exam	Learning Levels	PLOs
CLO 1	50%	40%	30%	C2	6
CLO 2	50%	10%	70%	C2	6

Contents

The Historical Background of Pakistan

Evolution and growth of Muslim society in Subcontinent

Muslim Revivalist and Reformist Movements

The Factors that shaped the Muslim Nationalism in the Subcontinent

The Factors that led birth to Pakistan

Ideology of Pakistan with special reference to Allama Muhammad Iqbal and Quaid-e-Azam Muhammad Ali Jinnah

Role of Sindh in Making of Pakistan

History of Internal and External Affairs of Pakistan:

The Constitutional and Political Developments in Pakistan (1947-1973)

The Constitution of 1973; Salient Features and Amendments

Political Development in Pakistan (1973 to date)

Determinants of Foreign Policy of Pakistan

Pakistan's Relations with Big Powers

Contemporary Pakistan (Issues and Challenges):

Geo-Strategic Significance of Pakistan

Economic Potential and its Utilization

Challenges to National Security of Pakistan

Internal Political, Economic and Legal Problems

Futuristic Outlook of Pakistan



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Books Recommended:

- Abdul Sattar, (2017), *Pakistan's Foreign Policy 1947–2016 A Concise History* (4th ed.), Karachi: Oxford University Press.
- Cohen Stephen, (2011), *The Future of Pakistan*. Washington: Brookings Institute Press.
- Hussian, Zahid, (2007), *Front line Pakistan: The Struggle with Militant Islam*, New York: I.B.Tauris.
- Jalal, Ayesha, (2014), *The Struggle for Pakistan: A Muslim Homeland and Global Politics*, The Belknap Press of Harvard University Press.
- Kazimi, M. R., (2008), *A Concise History of Pakistan*, Karachi: Oxford University Press.
- Khan, Hamid, (2017), *Constitutional and Political History of Pakistan* (3rd ed.), Karachi: Oxford University Press.
- Long, Roger D., (2015), *A History of Pakistan*, Karachi: Oxford University Press.
- Rais, RasulBakhsh, (2017), *Islam, Ethnicity, and Power Politics: Constructing Pakistan's National Identity*, Karachi: Oxford University Press.
- Riedel, Bruce, (2011), *Deadly Embrace: Pakistan, America, and the Future of Global Jihad*, Washington: Brookings Institute Press.
- Sayeed, K. B., (1960), *Pakistan: The Formative Phase*, Karachi: Oxford University Press.
- Talbot, Ian, (2014), *Pakistan: A New History*, Karachi: Oxford University Press.
- Wolpert, Stanley, (1997), *Jinnah of Pakistan*, Karachi: Oxford University Press.

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