



آغا خان یونیورسٹی ایگزامینیشن بورڈ
AGA KHAN UNIVERSITY EXAMINATION BOARD

Teaching and Learning Resources for Grade XI Statistics

Recommended Key Textbook:

Recommended Books

1. Beg M.Afzal, Mirza Miraj (2007). *Introduction to Statistics for Intermediate Part-I*. Lahore: Caravan Book House.
2. Beg M.Afzal, Mirza Miraj (2007). *Introduction to Statistics for Intermediate Part-II*. Lahore: Caravan Book House.

Reference Books

1. Ronald E. Walpole, Raymond H. Myers, *Probability and Statistics for Engineers and Scientists*, 9th Edition©2012 |Pearson
2. Jamal Shahid, (2020). *Statistics Problems and Practice*. Karachi: Ahmed Academy.

Additional Recommended Resource Material				
Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Reference Website
1	Introduction to Statistics			
1.1	Introduction		Descriptive and inferential statistics Sample and Population	https://study.com/academy/lesson/descriptive-and-inferential-statistics.html https://www2.southeastern.edu/Academics/Faculty/dgurney/Math241/StatTopics/ParamStat.htm https://www.scribbr.com/methodology/population-vs-sample/
			Limitations of Statistics	https://www.emathzone.com/tutorials/basic-statistics/limitations-of-statistics.html
1.2	Statistical Data		Primary and secondary data;	http://itfeature.com/statistics/primary-and-secondary-data-in-statistics http://bbamantra.com/methods-of-data-collection-primary-and-secondary-data/
			Questionnaire	http://www.fao.org/3/w3241e/w3241e05.htm
			Constant and variable	https://byjus.com/maths/difference-between-constants-and-variables/
			Discrete and continuous variables;	https://www.statisticshowto.datasciencecentral.com/discrete-vs-continuous-variables/

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Reference Website
1.3	Measurement Scale		Nominal scale, ordinal scale, cardinal scale, interval scale and ratio scale;	https://www.mymarketresearchmet hods.com/types-of-data-nominal-ordinal-interval-ratio/
3.6	Box and Whisker			https://www.youtube.com/watch?v=mhaGAaL6Abw https://www.youtube.com/watch?v=U0NZu6f5TMI
2	Presentation of Statistical Data			
2.1	Frequency Distribution Graphical Presentation		Relative Frequency	https://ftms.edu.my/v2/wp-content/uploads/2019/02/C2_Frequency_Distribution.pdf https://www.youtube.com/watch?v=vKWStqSbdXE https://www.youtube.com/watch?v=gq3FPpm2yvA https://www.youtube.com/watch?v=FCnqp-Z9FC4
2.2	Graphical Representation		Graphical representation of statistical data	https://www.slideshare.net/alisams er/graphical-representation-of-statistical-data
2.3	Types of Frequency curves and distribution		Frequency polygon	https://www.youtube.com/watch?v=PZVJ_NUxEUc https://www.youtube.com/watch?v=6H_4juL7RD8
			Frequency distribution and its types	https://getnave.com/blog/frequency-distribution-types/

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3.	Measures of location			
3.1	Central Tendency		What is central tendency?	https://corporatefinanceinstitute.com/resources/knowledge/other/central-tendency/
			Properties of arithmetic mean	https://www.youtube.com/watch?v=53TCgNSL4GA
			How to calculate mean, median and mode of grouped data?	https://www.youtube.com/watch?v=wrGYheq0whk
			Geometric mean	https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php
			Harmonic mean	https://byjus.com/harmonic-mean-formula/
3.5	Relationship between Arithmetic Mean, Geometric Mean and Harmonic Mean		Relationship between arithmetic mean, harmonic mean, and geometric mean of two numbers	https://www.youtube.com/watch?v=_OqizVbdZEA https://www.mathalino.com/reviewer/derivation-of-formulas/relationship-between-arithmetic-mean-harmonic-mean-and-geometric-mean

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3.6	Stem and Leaf Diagram		Construct stem and leaf diagram for: One set of data two sets of data (back to back);	https://www.youtube.com/watch?v=FCVYTImfw4g https://www.youtube.com/watch?v=Y3mB9jRHAjk https://www.youtube.com/watch?v=8ooKmIib0Yo https://www.youtube.com/watch?v=1AWk5tVILIA
	Median and Quantiles		Median and quartiles of ungrouped data Quantiles for ungrouped data Merits and demerits of median finding the median and Interquartile range for grouped data	https://www.youtube.com/watch?v=F3WcEAW-M80 https://www.youtube.com/watch?v=40o82o3uNfk https://www.youtube.com/watch?v=oiExdbz-0lA https://www.youtube.com/watch?v=zlADtyhKIBY
3.7	Mode		Mode of the data	https://www.mathsisfun.com/mode.html
3.8	Relationship between Mean, Median and Mode		Relationship between mean, median and mode	https://byjus.com/maths/relationship-between-mean-median-and-mode/

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Reference Website
4.1	Dispersion		Measure of dispersion	https://www.statisticshowto.datasciencecentral.com/dispersion/
4.2	Range		Range of the data	https://www.mathsisfun.com/data/range.html
4.3	Quartile Deviation		Quartiles and quartile deviation	https://www.mathsisfun.com/data/quartiles.html
4.4	Mean Deviation		Mean deviation	https://www.youtube.com/watch?v=GdIkEngwGNU
4.5	Variance and standard deviation		Variance and standard deviation	https://www.youtube.com/watch?v=yPrGQb-gmTs https://www.youtube.com/watch?v=HvDqbzu0i0E&list=RDCMUC4a-Gbdw7vOaccHmFo40b9g&index=1 https://www.mathsisfun.com/data/standard-deviation.html https://www.youtube.com/watch?v=E4HAYd0QnRc
4.6	Moments			https://uh.edu/~odonnell/econ2370/moment.pdf
4.7	Symmetry and skewness		Symmetry and skewness	https://www.siyavula.com/read/maths/grade-11/statistics/11-statistics-05 https://www.youtube.com/watch?v=vDRKITz7yo

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4.8	Kurtosis		What is Kurtosis?	https://www.thoughtco.com/what-is-kurtosis-3126241 https://www.youtube.com/watch?v=TM033GCU-SY
5.1	Introduction to Index Numbers		Introduction to index numbers	https://www.academia.edu/2191454/Chapter5_Index_number https://www.youtube.com/watch?v=uGf7oFeHCK8
5.2	Simple Relatives or Simple Index Numbers		Simple relatives or simple index numbers.	https://www.youtube.com/watch?v=Ypgo4qUBt5o https://www.youtube.com/watch?v=mIj3UstCI8Q https://www.youtube.com/watch?v=Gk7uUsMuKY8 https://www.youtube.com/watch?v=znpjLky9Csg https://www.youtube.com/watch?v=atLZNGsTN6k&t=34s https://www.youtube.com/watch?v=w-r42Hjq1lg https://www.youtube.com/watch?v=HN5d_02G8Jc https://www.youtube.com/watch?v=DE58QuNKA-c

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5.3	Unweighted Index Numbers		Unweighted index numbers	https://www.academia.edu/2191454/Chapter5_Index_number
5.4	Weighted Index Numbers		Weighted index numbers	https://www.brainkart.com/article/Weighted-Index-Number_39023/ https://www.youtube.com/watch?v=47WqUd27zvA
6.1	Simple Linear Regression		Simple Linear Regression	https://cosmologist.info/teaching/SAT/CHAP5.pdf https://www.youtube.com/watch?v=aq8VU5KLmkY https://www.youtube.com/watch?v=4otEcA3gjLk https://www.youtube.com/watch?v=aq8VU5KLmkY https://www.youtube.com/watch?v=4otEcA3gjLk
6.2	Simple Linear Correlation		Introduction to Correlation & Regression	https://www.youtube.com/watch?v=z7kMeJQWr4Y https://milnepublishing.geneseo.edu/natural-resources-biometrics/chapter/chapter-7-correlation-and-simple-linear-regression/

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6.3	Correlation of Ranked Data		Rank correlation	https://www.youtube.com/watch?v=0qLKfMm45-4 https://www.rgs.org/CMSPages/GetFile.aspx?nodeguid=f6c9f42a-ac87-43d2-89ae-fa2e2788c690&lang=en-GB
7.1	Concept of Time Series			https://www.youtube.com/watch?v=gj4L2isnOf8 https://www.youtube.com/watch?v=GUq_tO2BjaU
7.2	Measurement of Secular Trend		Secular trend and its measurement	https://www.brainkart.com/article/Methods-of-Measuring-Secular-Trend_39269/ https://www.youtube.com/watch?v=ca0rDWo7IpI https://www.youtube.com/watch?v=VfB-5FfLY18
8.1	Introduction to Vital statistics		Vital statistics and vital events	http://www.medicine.mcgill.ca/epidemiology/hanley/c609/Material/VitalStatisticsEoB.pdf https://www.healthknowledge.org.uk/public-health-textbook/health-information/3b-sickness-health/rates-ratios-measure-health
9.1	Introduction to Interpolation		Linear interpolation	https://www.youtube.com/watch?v=Cvc-XaIN_kk

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			Linear interpolation in Excel	https://www.youtube.com/watch?v=NefQRUXS_Vc
			Newton forward difference formula	https://atozmath.com/example/CONM/NumeInterPola.aspx?he=e&q=A
			Lagrange's formula to interpolate	https://brilliant.org/wiki/lagrange-interpolation/

Note: This resource list has been prepared primarily for teachers. While it can be shared with students, students should not be required to buy multiple books. Schools are encouraged to stock these books in the library. Moreover, these are only suggestions which have been compiled for the ease of teachers and students; schools are encouraged to use other resources for teaching and learning as well, as long as they are in line with the student learning outcomes (SLOs) mentioned in AKU-EB syllabi. Unless specified, AKU-EB does not endorse any of these books or websites. You are advised to use an ad-blocker while accessing the websites. In case any website is not functional for any reason, you may inform us at examination.board@aku.edu for an alternative or search material via any search engine. If you have any query, please contact us via email.



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10.	Counting Techniques		Probability and statistics topic index	https://www.statisticshowto.com/fundamental-counting-principle/
				https://www.youtube.com/watch?v=Mba29Xp9G5E
			Difference between permutations and combinations	https://www.youtube.com/watch?v=0NAASclUm4k
				https://www.youtube.com/watch?v=XPPYYM6WCuE
				https://www.youtube.com/watch?v=J2IWwbSbN4M

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11.	Probability	* Statistics Problems & Practice *Probability & Statistics By Walpole/Myers	Basics of Probability Probability Tree Diagram, Venn Diagram and probability	https://www.youtube.com/watch?v=KzfWUEJjG18 https://www.youtube.com/watch?v=uzkc-qNV0Ok https://opentextbc.ca/introstatopensax/chapter/tree-and-venn-diagrams/ https://www.khanacademy.org/math/precaculus/x9e81a4f98389efdf:p-rob-comb/x9e81a4f98389efdf:addition-rule-prob-precac/v/probability-with-playing-cards-and-venn-diagrams https://www.khanacademy.org/math/precaculus/x9e81a4f98389efdf:p-rob-comb/x9e81a4f98389efdf:addition-rule-prob-precac/v/addition-rule-for-probability

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12.	Random Variables and Probability Distribution		<p>Random variables discrete and continuous</p> <p>Cumulative distribution function</p> <p>Probability density functions</p>	<p>https://www.youtube.com/watch?v=82Ad1orN-NA&list=PLDp9Jik5WjRtVUYHjx_Q0KohHqqDVKhcX</p> <p>https://www.youtube.com/watch?v=qs_79VE5-Hs&list=PLDp9Jik5WjRtVUYHjx_Q0KohHqqDVKhcX&index=2</p> <p>https://www.youtube.com/watch?v=bNmlAC22cAg&list=PLDp9Jik5WjRtVUYHjx_Q0KohHqqDVKhcX&index=3</p> <p>https://www.econometrics-with-r.org/2-1-random-variables-and-probability-distributions.html</p>
13.	Special Discrete Probability Distributions			<p>https://www.youtube.com/watch?v=lHhyy4JMigg</p> <p>https://www.youtube.com/watch?v=Jm_Ch-iESBg</p>

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14.	Special Continuous Probability Distribution		An introduction to continuous probability distributions Different types of continuous probability distributions	https://www.youtube.com/watch?v=OWSOhpS00s https://www.youtube.com/watch?v=QxqxdQ_g2uw
15.	Sampling and Sampling Distributions		Introduction to sampling distributions Central limit theorem - sampling distribution of sample means	https://www.youtube.com/watch?v=z0Ry_3_qhDw https://www.youtube.com/watch?v=4YlTvNeRIrg
16.	Estimation		Estimation and Confidence Intervals Confidence intervals and margin of error 01 - Estimating Population Proportions, Part 1 - Learn Confidence Intervals in Statistics	https://www.youtube.com/watch?v=_BiVb6neUP0 https://www.youtube.com/watch?v=hLM7zdf7zwU https://www.youtube.com/watch?v=e6HsIWQJjdM
17.	Hypothesis Testing		Intro to Hypothesis Testing in Statistics What Is Hypothesis Testing?	https://www.youtube.com/watch?v=VK-rnA3-41c https://www.investopedia.com/terms/h/hypothesistesting.asp
18.	Association of Attributes		Association of attributes and types of association Types of Association	https://www.britannica.com/topic/measure-of-association https://www.myassignmenthelp.net/theory-of-attributes-assignment-help

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19.	Design of Experiment		Design of experiment What is Design of Experiment? Why Do Designs of Experiments Fail?	https://asq.org/quality-resources/design-of-experiments https://www.theopeneducator.com/doi/Introduction-to-Design-of-Experiments/What-is-Design-of-Experiment

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