

# Curricula/Syllabi of BS Information Technology for Punjab University Affiliated Colleges

## Scheme Of Studies / Semester-Wise Workload

1 <sup>st</sup> Semester					
Sr.	Code	Course Title	Course Type	Prerequisite	Cr. Hrs.
1	GE-161	Introduction to ICT	General Education		2
2	GE-161L	Introduction to ICT - Lab	General Education		1
3	GE-162	English Composition and Comprehension	General Education		3
4	GE-163	Islamic Studies	General Education		3
5	GE-165	Pakistan Studies	General Education		3
6	MS-151	Applied Physics	Math & Science Foundation		2
7	MS-152	Calculus and Analytical Geometry	Math & Science Foundation		2
8	HQ-001	Translation of Holy Quran	Quran and Sunnah		0
9	MD-001	Math Deficiency - I	Deficiency Course		3*
<b>Total Credit Hours: 16</b>					

## 7. GENERAL EDUCATION COURSES

<b>Course Title</b>	<b>Introduction to Information and Communication Technologies</b>
<b>Course Code</b>	<b>GE-161</b>
<b>Credit Hours</b>	2+1
<b>Category</b>	General Education
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	None
<b>Course Description</b>	<p><b>Computers:</b> Importance and History of Computers. Types of Computers. Computer Elements, Processor, Memory, Hardware, Software. <b>Application Software its Uses and Limitations:</b> Word Processing, Spreadsheet, Database Management System etc. <b>System Software its Importance:</b> MS-DOS, Windows, and Linux. <b>Computer Based Information System (CBIS):</b> Methods of Input, Storage and Processing, Terminal (Dump, Smart, Intelligent), Data Storage Units, RAID and Backup System, Dedicated Data Entry, SDA (Source Data Automation). Organizing Computer Facility, Centralized Computing Facility, Distributed Computing Facility. <b>Data Communications:</b> Data Communication Model, Data Transmission, Digital and Analog Transmission, Modems, Asynchronous and Synchronous Transmission, Simplex, Half Duplex, Full Duplex Transmission, Communication Medias (Cables, Wireless), Protocols, Network Topologies (Star, Bus, Ring), LAN, WAN, MAN. <b>Internet and World Wide Web (WWW):</b> A Brief History of the Internet and WWW, ARPANet, Internet Services provider and Online Services Providers, Web Link, Browser, Function and Features of Browser, Search Engines. Common Services available on Internet. Multimedia Website Design. <b>Business on Web:</b> E-Commerce, E-Commerce business models, B2C, C2C, B2G, and Types of E-Commerce Websites. <b>Information Security and Privacy:</b> Significance of Information Security and Privacy in the Information Age. Computer Sabotage, Computer Virus and Malwares, DoS Attack. Online Data, Information and Identity theft, Online Frauds, Internet Scam, Phishing and Pharming, Privacy and Security issues in Social Media.</p>
<b>Text Book(s)</b>	1. Deborah Morley and Charles S. Parker, Understanding Computers: Today and Tomorrow, 16th edition, Cengage Learning, 2016, ISBN-13: 978-1337251853
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>1. Livesley, Robert Kenneth. An introduction to automatic digital computers. Cambridge University Press, 2017.</li> <li>2. Zawacki-Richter, Olaf, and Colin Latchem. "Exploring four decades of research in Computers &amp; Education." Computers &amp; Education 122 (2018): 136-152.</li> <li>3. Sinha, Pradeep K., and Priti Sinha. Computer fundamentals. BPB publications, 2010.</li> <li>4. Goel, Anita. Computer fundamentals. Pearson Education India, 2010.</li> </ol>

<b>Course Title</b>	<b>Introduction to Information and Communication Technologies Lab</b>
<b>Course Code</b>	<b>GE-161-L</b>
<b>Credit Hours</b>	1
<b>Category</b>	General Education
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	None
<b>Course Description</b>	<p><b>Hardware and Operating Systems:</b> Interaction with CPU components and various hardware devices, familiarity with PC Troubleshooting, familiarity with network connectivity, Microsoft Windows and Virtual Box installations, Linux installation in Virtual Box, basic operations of Microsoft Windows, use of Command Line Interface in MS-DOS and Linux, installation of different application Software. <b>Productivity Software:</b> Document editing and formatting to prepare a broad range of documents including CVs, applications, letters, reports, and business documents using in Microsoft Word. Use of Microsoft Excel tools and functions which are most useful to improve daily operational efficiency including data acquisition, formulas, data manipulation, data analysis and graphing etc. Design of presentations using Microsoft PowerPoint. Graphics design using basic graphics designing tool. <b>Searching and Managing Information:</b> Search engines, information retrieval from search engines, search engines query types. Usage of Google products including drive, docs, sheets, slides, contacts, groups, calendar, meet, forms, maps, sites, Jamboard etc. <b>Extended Web Utilities:</b> Introduction and usage of useful websites and web portals for education, creativity, recreation, news etc. <b>Database Management:</b> Introduction to data and information, files and database, creation of tables, forms, queries, reports in Microsoft Access. Usage of various templates in Microsoft Access. <b>Web Design:</b> Design of multimedia website using Hyper Text Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript.</p>
<b>Text Book(s)</b>	<ol style="list-style-type: none"> <li>1. Joan Lambert, Curtis Frye, Microsoft Office 2019 Step by Step, First Edition. ISBN: 978-1-50-930597-1.</li> <li>2. Craig Zacker, Microsoft Official Academic Course, MICROSOFT WORD 2016, Wiley Publisher, 2016. ISBN: 978-1-11-927299-1</li> <li>3. Joyce J. Nielsen, Microsoft Official Academic Course, MICROSOFT EXCEL 2016, Wiley Publisher, 2016. ISBN: 978-1-11-927300-4</li> <li>4. Mary Lemons, Microsoft Official Academic Course, MICROSOFT POWERPOINT 2016, Wiley Publisher, 2016. ISBN: 978-1-11-927303-5.</li> <li>5. Mary Lemons, Microsoft Official Academic Course, MICROSOFT ACCESS 2016, Wiley Publisher, 2016. ISBN: 978-1-11-927443-8.</li> <li>6. Jennifer Niederst Robbins, Learning, Web Design A Beginner's Guide To HTML, CSS, JavaScript, and Web Graphics, 5th Edition, ISBN: 978-1-491-96020-2.</li> </ol>
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>1. Jeremy Osborn, Jennifer Smith, Web Design with HTML and CSS Digital Classroom, 2011, ISBN: 978-0-470-58360-9.</li> <li>2. J. M. Gustafson - HTML5 Web Application Development by Example Beginner's Guide-Packt Publishing, 2013, ISBN 978-1-84969-594-7.</li> </ol>

<b>Course Title</b>	<b>English Composition and Comprehension</b>
<b>Course Code</b>	<b>GE-162</b>
<b>Credit Hours</b>	3
<b>Category</b>	General Education
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow-up</b>	None
<b>Course Description</b>	Writing Basics, Sentence structure, Choice of words and appropriateness, Use of capitals and first and second person pronouns, Active and passive, Complete guide to style, Good usage: the split infinitive and all that general English rules and principles, Punctuation and use of capitals, A short grammar of current English: Parts of speech; nouns, pronouns, adjectives, Determiners, Verbs, Adverbs, Articles, Prepositions, conjunctions, words and suffixes, Phrases, clauses and sentences; linking phrases, transitions, coherence and unity, Genres of essays; narrative, descriptive and argumentative, short stories; understanding the basic differences, Features of a book review, How to write a bibliography and references, Idioms and figure of speech, Phrasal Verbs, Writing Assignments and Using the computer to improve writing, Reading Comprehension, Summarizing: descriptive, informative and evaluative summary, Simple application format and writing, Letter formats and writing, How to Write Effective Emails, Differences between British and American English.
<b>Text Book(s)</b>	1. George Stern, Writing in English: An Invaluable Guide to Effective Writing, Didax Educational Resources, 2004, ISBN-13: 978-1583241868
<b>Reference Material</b>	

<b>Course Title</b>	<b>Islamic Studies</b>
<b>Course Code</b>	<b>GE-163</b>
<b>Credit Hours</b>	2
<b>Category</b>	General Education
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow-up</b>	None
<b>Course Description</b>	Basic Themes of Quran, Introduction to Sciences of Hadith, Introduction to Islamic Jurisprudence, Primary & Secondary Sources of Islamic Law, Makken & Madnian life of the Prophet, Islamic Economic System, Political theories, Social System of Islam.
<b>Text Book(s)</b>	<ol style="list-style-type: none"><li>1. M. Hamidullah, Introduction to Islam, Kitab Bhavan, 1992, ISBN: 8171511546.</li><li>2. Ahmad Hasan, Principles of Islamic Jurisprudence, Islamic Research Institute, IIU, Islamabad, 1993, ISBN: 8174350292.</li></ol>
<b>Reference Material</b>	<ol style="list-style-type: none"><li>1. Mir Waliullah, Muslim Jurisprudence and the Quranic Law of Crimes, 2<sup>nd</sup> Edition, Taj Publishers, 1986, ISBN: 8185213097.</li></ol>

<b>Course Title</b>	<b>Pakistan Studies</b>
<b>Course Code</b>	<b>GE-165</b>
<b>Credit Hours</b>	2
<b>Category</b>	General Education
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow-up</b>	None
<b>Course Description</b>	<b>Historical background of Pakistan:</b> Muslim society in Indo-Pakistan, the movement led by the societies, the downfall of Islamic society, the establishment of British Raj- Causes and consequences. <b>Political evolution of Muslims in the twentieth century:</b> Sir Syed Ahmed Khan, Muslim League, Nehru, Allama Iqbal, Independence Movement, Lahore Resolution. <b>Current State of Affairs:</b> Pakistan culture and society, Constitutional and Administrative issues, Pakistan and its geo-political dimension, Pakistan and International Affairs, Pakistan and the challenges ahead.
<b>Text Book(s)</b>	<ol style="list-style-type: none"> <li>1. Chaudary M. Ali, The Emergence of Pakistan, Columbia University Press, 1967, ISBN: 0231029330.</li> <li>2. K. K. Aziz, The Making of Pakistan, Sang-e-Meel Publications, 2002, ISBN: 969350870X.</li> </ol>
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>1. I. H. Qureshi, ed., A Short History of Pakistan, University of Karachi, 1967, ISBN: 9694040086.</li> </ol>

## 6. MATH &amp; SCIENCE FOUNDATION COURSES

<b>Course Title</b>	<b>Applied Physics</b>
<b>Course Code</b>	<b>MS-151</b>
<b>Credit Hours</b>	3
<b>Category</b>	Math & Science Foundation
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	None
<b>Course Description</b>	<p><b>Topics: Electric force:</b> Introduction to electric force, its applications and related problems, conservation of charge, charge quantization, Electric fields due to point charge and lines of force. Ring of charge, Disk of charge, A point charge in an electric field, Dipole in a n electric field, The flux of vector field, The flux of electric field, Gauss' Law, Application of Gauss' Law, Spherically symmetric charge distribution, A charged isolated conductor. <b>Electric potential energy:</b> Electric potentials, Calculating the potential from the field and related problem Potential due to point and continuous charge distribution, Potential due to dipole, equipotential surfaces, Calculating the field from the potential. <b>Electric current:</b> Current density, Resistance, Resistivity and conductivity, Ohm's law and its applications, The Hall effect, The magnetic force on a current, The Biot-Savart law, Line of B, Two parallel conductors, Amperes' s Law, Solenoid, Toroids, Faraday's experiments, Faraday's Law of Induction, Lenz's law, Motional emf. Induced electric field, Induced electric fields. <b>Electromagnetics:</b> The basic equation of electromagnetism, Induced Magnetic field, The displacement current, Reflection and Refraction of light waves, Total internal reflection, Two source interference, Double Slit interference, related problems, Interference from thin films, Diffraction and the wave theory, related problems, Single-Slit Diffraction, related problems, Polarization of electromagnetic waves, Polarizing sheets, related problems.</p>
<b>Text Book(s)</b>	1. D. Halliday, R. Resnick, Kenneth S. Krane, Physics Vol. 2, 5th Ed., John Wiley, 2001, ISBN: 978-0471401940.
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>Hugh D. Young, Roger A. Freedman, A. Lewis, Sears, University Physics, 11th Ed., Benjamin-Cummings Pub. Co., 2004, ISBN: 978-0805391794.</li> <li>D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 6th Ed., Wiley, 2010, ISBN: 978-0470469118.</li> </ol>

<b>Course Title</b>	<b>Calculus and Analytical Geometry</b>
<b>Course Code</b>	<b>MS-152</b>
<b>Credit Hours</b>	3
<b>Category</b>	Math & Science Foundation
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	None
<b>Course Description</b>	Motivation and applications of the course. <b>Introduction to limits:</b> Limits and Continuity, Techniques of finding limits, Indeterminate forms of limits, <b>Introduction to functions:</b> Continuous and discontinuous functions and their applications, <b>Differential calculus:</b> Concept and idea of differentiation, Geometrical and Physical meaning of derivatives, Rules of differentiation, Techniques of differentiation, Rates of change, Tangents and Normal lines, Chain rule, implicit differentiation, linear approximation, <b>Applications of differentiation:</b> Extreme value functions, Mean value theorems, Maxima and Minima of a function for single-variable, Concavity. <b>Integral calculus:</b> Concept and idea of Integration, Indefinite Integrals, Techniques of integration, Riemann sums and Definite Integrals, Applications of definite integrals, Improper integral, Applications of Integration; Area under the curve. <b>Analytical Geometry:</b> Straight lines in $R^3$ , Equations for planes.
<b>Text Book(s)</b>	1. Howard Anton, Irl C. Bivens and Stephen Davis, Calculus, 11 <sup>th</sup> Edition, Wiley, 2016, ISBN-10: 1119228581, ISBN-13: 978-1119228585.
<b>Reference Material</b>	1. Thomas and Finney, Calculus and Analytic Geometry, 9 <sup>th</sup> Edition, ISBN-13: 978-0201531749, ISBN-10: 0201531747.



<b>Course Title</b>	<b>Translation of Holy Quran</b>
<b>Course Code</b>	<b>HQ-001</b>
<b>Credit Hours</b>	0
<b>Category</b>	Quran and Sunnah
<b>Prerequisite</b>	None
<b>Follow-up</b>	HQ-002: Translation of Holy Quran
<b>Course Description</b>	<p><b>Surah al-Fatiha to Surah Al-Imran</b> (سورۃ الفاتحہ تا سورۃ آل عمران): Translation of Verses into English or Urdu language (آیات کا انگریزی یا اردو زبان میں ترجمہ), Meaning of Qur'anic words into English or Urdu language (انگریزی یا اردو زبان میں قرآنی الفاظ کے معانی),</p> <p><b>Attached pronouns</b>(ضمائر متصلہ): Use attached pronouns with word and give their meanings (لفظ کے ساتھ ضمائر متصلہ لگائیں اور ان کے معنی بتائیں).</p>

## 1. MATH DEFICIENCY COURSES

<b>Course Title</b>	<b>Math Deficiency - I</b>
<b>Course Code</b>	<b>MD-001</b>
<b>Credit Hours</b>	3*
<b>Category</b>	Deficiency Course
<b>Prerequisite</b>	None
<b>Co-Requisite</b>	None
<b>Follow Up</b>	Math Deficiency-II
<b>Course Description</b>	<p><b>Sets:</b> Definition, various types of set representation and operations. <b>Relation and Function:</b> Graphical transformation of one and two dimensional functions, Properties of functions, composition and inverses of functions, domain and range of the functions, Maximum and minimum values of functions, increasing and decreasing functions, zeros and intercept of functions, piecewise functions, continuity and Discontinuity of functions, Polynomials and rational functions, Polynomial long division and Synthetic division, Solution of rational functions, Absolute valued function, properties of absolute valued functions, Asymptotes (Horizontal, vertical and oblique), Exponential functions and their properties, Logs functions and their properties. <b>Systems of Equations:</b> Systems of Two Equations and Two Unknowns, Systems of Three Equations and Three Unknowns. <b>Matrix Algebra:</b> Addition, subtraction and multiplication. Row Operations and Row Echelon Forms, Augmented Matrices, Determinant of Matrices (2 x 2 and higher order matrices), Cramer's Rule, Inverse Matrices. <b>Series and Sequences.</b> <b>Trigonometry:</b> Angles in Radians and Degrees, Right Triangle Trigonometry, Law of Cosines &amp; Sines, Area of Triangle, Graphs of Other Trigonometric Functions, Graphs of Inverse Trigonometric Functions, Basic Trigonometric Identities (Pythagorean, Sum and Difference, Double, Half, and Power Reducing), Trigonometric Equations. <b>General Form of a Conic:</b> Parabolas, Circles, Ellipses, Hyperbolas, Degenerate Conics. <b>Polar and Parametric Equations:</b> Polar and Rectangular Coordinates.</p>
<b>Text Book(s)</b>	<ol style="list-style-type: none"> <li>1. Textbook of Algebra and Trigonometry Class XI is published by Punjab Textbook Board (PTB) Lahore, Pakistan.</li> <li>2. Calculus and Analytic Geometry, MATHEMATICS 12 (Mathematics FSc Part 2 or HSSC-II), Punjab Text Book Board Lahore, Pakistan</li> </ol>
<b>Reference Material</b>	<ol style="list-style-type: none"> <li>1. Gilbert, S. S., B. C. Andy and B. Andrew, B. 2005. Linear Algebra and Its Applications. 4th Ed. Thomson Brooks/Cole, Belmont, CA, USA.</li> </ol>