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

Scheme Of Studies / Semester-Wise Workload

6th Semester					
Sr.	Code	Course Title	Course Type	Prerequisite	Cr. Hrs.
1	DI-323	System and Network Administration	Domain Core	Operating Systems	3
2	DI-323	System and Network Administration Lab	Domain Core	Operating Systems	1
3	DI-326	Artificial Intelligence	Domain Core	Data Structures & Algos.	3
4	SI-342	Enterprise Systems	IT Supporting	Database Systems	3
5	EI-333	Mobile Application Development	IT Elective		3
6	UE-272	Principles of Management	University Elective		3
7	HQ-006	Translation of Holy Quran	Quran and Sunnah	Translation of Holy Quran	1
Total Credit Hours: 17					

Course Title	**System and Network Administration**
Course Code	**DI-323**
Credit Hours	3+1
Category	Domain Core
Prerequisite	CC-311: Operating Systems
Co-Requisite	None
Follow-up	None
Course Description	**Introduction**: System Administration (SA), SA Components, Server Environment (Microsoft and Linux), Reliable Products, Server Hardware Costing, Maintenance Contracts and Spare Parts, Maintaining Data Integrity, Client Server OS Configuration, Providing Remote Console Access. **Comparative Analysis of OS:** Important Attributes, Key Features, Pros and Cons. **Linux Installation and Verification**: Configuring Local Services and Managing Basic System Issues. Administer Users and Groups. **System and Network Management:** Software Management. Managing Network Services and Network Monitoring Tools. Boot Management and Process Management. IP Tables and Filtering. Securing Network Traffic. Advanced File Systems and Logs. Bash Shell Scripting. Configuring Servers (FTP, NFS, Samba, DHCP, DNS and Apache).
Text Book(s)	1. The Practice of System and Network Administration, Second Edition by Thomas Limoncelli, Christina Hogan and Strata Chalup, Addison-Wesley Professional; 2nd Edition (2007). ISBN-10: 0321492668. 2. Study guide for Practice of System and Network Administration by Thomas A. Limoncelli, Cram101; 2nd Edition (2011). ISBN-10: 1428851755. 3. Networking Systems Design and Development by Lee Chao, CRC Press; 1st Edition (December 21, 2009). ISBN-10: 142009159X (TB2).
Reference Material	1. Red Hat Enterprise Linux 6 Bible: Administering Enterprise Linux Systems by William von Hagen, 2011.

Course Title	**System and Network Administration Lab**
Course Code	**DI-323L**
Credit Hours	1
Category	Domain Core
Prerequisite	CC-311: Operating Systems
Co-Requisite	None
Follow-up	None
Course Description	**Introduction:** Review of computer networks lab, Server Environment (Microsoft and Linux). **Installation and Configuration:** Client Server OS Configuration, Installation and configuration of servers, Linux Installation and Verification, Installation of Activity Directory on Domain Controller, Manage and Active Directory Forest and domain. **Managing Network Services**: Network Monitoring Tools. Boot Management and Process Management. IP Tables and Filtering. **Securing Network Traffic**. Advanced File Systems and Logs. Bash Shell Scripting. **Managing Servers**: FTP, NFS, Samba, DHCP, DNS and Apache. Configuring Local Services and Managing Basic System Issues. Administer Users and Groups. Domain controller. **Installation and Configuration of Wireless Access Points**: Installation and configuration if wireless Router, Manageable and non-manageable Cisco switches, Concept and configuration of VLAN, Switch modes and operations, setting up WAN on simulator, identifying necessary devices to build a WAN, learning static and dynamic routing protocols, Understanding and implementing RIP (Routing Information Protocol). Understanding and implementing IGRP, ACL's configuration on routers.
Text Book(s)	1. The Practice of System and Network Administration, Second Edition by Thomas Limoncelli, Christina Hogan and Strata Chalup, Addison-Wesley Professional; 2nd Edition (2007). ISBN-10: 0321492668. 2. Study guide for Practice of System and Network Administration by Thomas A. Limoncelli, Cram101; 2nd Edition (2011). ISBN-10: 1428851755. 3. Networking Systems Design and Development by Lee Chao, CRC Press; 1st Edition (December 21, 2009). ISBN-10: 142009159X (TB2).
Reference Material	1. Red Hat Enterprise Linux 6 Bible: Administering Enterprise Linux Systems by William von Hagen, 2011.

Course Title	**Artificial Intelligence**
Course Code	**DI-326**
Credit Hours	3
Category	Technical Elective
Prerequisite	Data Structures and Algorithms
Co-Requisite	None
Follow-up	None
Course Description	**Introduction:** Basic component of AI, Identifying AI systems, branches of AI, etc. types of problems addressed. **Searching Strategies:** exhaustive & heuristic search techniques, informed searching, uninformed searching, local searching. Game playing. Genetic algorithms. Constraint. satisfaction problems. **Symbolic AI & Logic programming:** The physical symbol system hypothesis. Knowledge representation & search in the context of logic programming. **Reasoning in logic programming:** unification, horn clause logic, and resolution, Prolog as example logic programming formalism. **Knowledge Representation Schemas:** Logic, propositional logic, first order logic, frames, semantic nets, scripts; problems in knowledge representation. Expert systems. **Machine Learning:** Introduction, unsupervised learning, supervised learning, reinforcement learning, decision trees, Bayesian classification, artificial neural networks, **Selected Topics in AI:** Fuzzy logic, natural language processing, computer vision.
Text Book(s)	1. Stuart Russell and Peter Norvig, Artificial Intelligence. A Modern Approach, 4th edition, Prentice Hall, Inc., 2020.
Reference Material	1. Luger, G.F. and Stubblefield, W.A., 2009. AI algorithms, data structures, and idioms in Prolog, Lisp, and Java. Pearson Addison-Wesley. 2. George F. Luger, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, 6th Edition, Pearson, 2008, ISBN-13: 978-0321545893. 3. Hart, P.E., Stork, D.G. and Duda, R.O., Pattern classification. John Willey & Sons, 2001. 4. Ivan Bratko, Prolog: Programming for Artificial Intelligence, 4th Edition, Pearson, 2011, ISBN-13: 978-0321417466. 5. P. Winston, Artificial Intelligence, 3rd Edition, Pearson, 1992, ISBN-13: 978-0201533774.

Course Title	**Enterprise Systems**
Course Code	**SI-342**
Credit Hours	3
Category	IT Supporting
Prerequisite	None
Co-Requisite	DI-222: Web Technologies
Follow-up	None
Course Description	**Overview of Enterprise Application Development**: Microsoft technology history, Introduction to .NET and its architecture, Concept of MSIL, CLR, CLS, CTS, **Introduction to .NET framework:** Managed and Unmanaged Code, .Net Assembly, Introduction to C# fundamentals, Boxing and Unboxing, Implementing multi-tier architecture. **Introduction to ADO.Net**: Sql Injection, parameterized queries, Usage of data set, Data adapter and command builder in disconnected model **Introduction to delegate**: Multicast delegates, Introduction to windows forms, html, **Introduction to javascript:** javascript and its data types, variables, functions, Debugging javascript using Firebug. **Introduction to various object models:** Browser's Object (BOM), Document Object Model. **Introduction to Jquery:** Jquery effects. **Introducing LINQ:** LINQ to Objects, LINQ to Sql, Query syntax, Operations (projection, filtering and join) using Linq Queries. **Introduction to ADO.NET entity framework**: The entity data model, CSDL, Eager vs lazy loading, POCO classes, DBContext API, Querying entity data models, Introduction to ASP.NET MVC, MVC application structure, Controllers overview, Action Methods, Parameterized action methods, Introduction to razor syntax, Code expressions, Code Blocks, Implicit Vs Explicit Code Expression, Data annotations, Client and server Side Validation, Validation and model binding, Validation and model state, MVC Membership, Authorization and security. **Introduction to service oriented architecture**: SOAP, WSDL, Service contract, Data contract, XML, WCF bindings, ABC of WCF, Restful services, Consuming rest services (CRUD operations) using Jquery AJAX and JSON, Introduction to web API, Example of web API using CRUD Example, MVC routing.
Text Book(s)	1. Herbert Schildt, C# 4.0 The Complete Reference, McGraw-Hill, 2010, ISBN: 007174116X. 2. A. Freeman, S. Sanderson, Pro ASP.NET MVC 4, 4th Edition, Apress, 2012, ISBN: 1430242361.
Reference Material	1. Julia Lerman, Programming Entity Framework, 2nd Edition, O'Reilly, 2010, ISBN: 0596807260. 2. Fabrice Marguerie, Steve Eichert, Jim Wooley, LINQ in Action, Manning Publications, 2008, ISBN: 1933988169. 3. Jeremy McPeak, Beginning JavaScript, 5th Edition, Wiley, 2015, ISBN: 978-1-118-90333-9. 4. Pablo Cibraro, Kurt Claeys, Fabio Cozzolino, Johann Grabner, Professional WCF 4: Windows Communication Foundation with .NET 4, Wiley, 2010, ISBN: 978-0-470-56314-4. 5. Handouts and Internet references

Course Title	Mobile Application Development
Course Code	EI-333
Credit Hours	3
Category	Technical Elective
Prerequisite	CC-211: Object Oriented Programming
Co-Requisite	None
Follow-up	None
Course Description	**Introduction:** Mobile Computing Domain, Comparison of different Mobile Platforms, Revision of Java. **Android Platform:** Dalvik Virtual Machine, Android Constructs (Activity, Intent, Content Provider, Service, Broadcast Receiver), Activity Lifecycle, Project Structure, Manifest File, Emulators (AVD), Debugging (DDMS), R.java, Inter Activity Communication (Intent), Event Handlers, Layout XML, @ Sign, Layouts, Adapters, Dynamic Lists, Holder Pattern, Menus and dialogs, Menu, Menu Group, Menu Item, Icon Menu, Sub Menu, Context Menu, Sub Menu, Dynamic Menu, Using XML Files for Menus, Services, Intents. **Data Storage:** Key Value Sets, Files, Intro to SQLite, Web Service Integration, JSON, HTTPClient, Graphics, Widgets & Notifications, Multimedia and telephony API, Android Native Development Kit (NDK).
Text Book(s)	1. Mark L. Murphy, Beginning Android 2, Apress, ISBN 978-1-4302-2629-1 2. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura Programming Android, 2nd Edition, O Reilly Press, ISBN: 978-1-449-31664-8 3. Syed Hashmi, Satya Komatineni, Dave Maclean, Pro Android 2, Apress, ISBN 978-1-4302-2659-8
Reference Material	1. http://developer.android.com/develop/index.htm 2. http://developer.android.com/guide/components/services.html 3. http://developer.android.com/guide/components/intents-filters.html 4. http://developer.android.com/guide/topics/data/data-storage.html 5. http://developer.android.com/guide/topics/graphics/index.html 6. http://developer.android.com/guide/topics/sensors/index.html

Title	**Principles of Management**
Code	**UE-273**
Credit Hours	3
Category	Management Related University Elective
Prerequisite	None
Co-Requisite	None
Follow-up	None
Course Description	**Managing and the Managers Job:** The management process, kinds of managers, basic managerial roles and skills, and the nature of managerial work. **The Environment and Culture of Management:** The external and internal environment, the organization's cultures, organization-environment relationship. **Planning and Decision Making:** Decision making and planning process, organizational goals and levels of planning, various levels of strategies, rational perspectives on decision making, behavioral aspects of decision making, group and team decision making in organizations. **The Organizing Process:** Designing Jobs, grouping jobs, establishing reporting relationships, distributing authority, coordinating activities. **Managing Change and Innovation:** Forces for change, steps in the change process, understanding and overcoming resistance to change, the innovation process. **Leadership and Influence Process:** Different approaches to leadership, political behavior in organizations. **The Controlling Process:** The purpose of control, steps in the control process; operational, structural, and strategic control, managing total quality and productivity. **The Ethical and Social Environment:** Individual ethics in organization, emerging ethical issues, social responsibility and organizations.
Text Book(s)	1. Ricky W. Griffin, Management, 12th Edition, Cengage Learning, 2017, ISBN: 1305501292.
Reference Material	1. Stephen P Robbins, Mary Coulter, Management, 14th Edition, Pearson, 2017, ISBN: 0134527607.

Course Title	**Translation of Holy Quran**
Course Code	**HQ-006**
Credit Hours	0
Category	Quran and Sunnah
Prerequisite	HQ-005: Translation of Holy Quran
Follow-up	HQ-007: Translation of Holy Quran
Course Description	**Surah Ash-Shu'ara to Surah Sad**(سورۃ الشعراء تا سورۃص):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), **Attached pronouns**(ضمائر متصلہ):Use attached pronouns with word and give their meanings (لفظ کے ساتھ ضمائر متصلہ لگائیں اور ان کے معنی بتائیں).