

# Leveraging the Legacy of Conventional Libraries for Organizing Digital Libraries

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This document contains the full experimental results of our BB-ATC system.

- The proposed ATC system was used to automatically classify 100 syllabus documents which mainly belong to the field of computer science.
- The validity and correctness of each assigned DDC class label is examined manually by an expert cataloguer. When necessary, additional notes are provided to help clarify the results.
- Each time a new class appears in the results if the caption of the class is not self explanatory then some additional information about that class is provided in form of footnotes. The source for these class descriptions is the WebDewey website (<http://connexion.oclc.org>) which provides access to the latest version of DDC scheme (DDC22 at the time of creating this document).

True Positive	False Positive	False Negative	Precision	Recall	F1
210	19	26	0.917	0.889	0.902

Classification results summary

## LEGEND

<b>TP</b>	<u>True Positive</u>
<b>FP</b>	<u>False Positive</u>
<b>FN</b>	<u>False Negative</u>
<b>NC</b>	<u>Not Catalogued</u> : the referenced item is not catalogued in either Library of Congress or British Library catalogues.
<b>CE</b>	<u>Cataloguer's Error</u> : The cataloguers in either the Library of Congress or British Library have classified the item into the wrong class (manual classification error) or they have labelled the item with an invalid class number (data entry error).

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<b>Syllabus No. 1</b>	
<b>Module Title</b>	<b>Security Fundamentals</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Appreciation for the complexity of issues within the computer security field.</li> <li>• Conversant in the need for security within communication systems and how it can be achieved.</li> <li>• Investigate the fundamentals of cryptographic algorithms and protocols.</li> <li>• Understand the need for security management and policy creation.</li> <li>• Recognise the need for a pre-planned and structured incidence response.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0321247442	005.8 <b>TP</b>	Data security <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Computer security</li> </ul>
0131711296	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer security</li> <li>▪ Computer networks -- Security measures</li> </ul>
0470038217	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer security</li> <li>▪ Computer networks</li> <li>▪ Electronic data processing personnel</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Data security (005.8)	3	Computer security	3

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<sup>1</sup> Class here access control, computer network security, firewalls

<b>Syllabus No. 2</b>	
<b>Module Title</b>	<b>Host and Network Security</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Gain an in-depth knowledge of host and network security.</li> <li>• Assess the security of a network.</li> <li>• Recommend and implement measures to prevent security threats.</li> <li>• Research and develop security audits</li> <li>• Conversant in current trends and methodologies.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0072260815	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Microsoft Windows (Computer file)</li> <li>▪ Computer security.</li> <li>▪ Computer networks -- Security measures.</li> <li>▪ Data protection.</li> </ul>
0782144373	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Electronic data processing personnel --Certification.</li> <li>▪ Computer security -- Examinations – Study guides.</li> <li>▪ Computer hackers</li> </ul>
0321294319	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Microsoft Windows (Computer file)</li> <li>▪ Computers -- Access control.</li> <li>▪ Computer security.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Data security (005.8)	3	Computer security	2
		Microsoft Windows (Computer file)	2

**NOTE:** The reason for allocating “*Microsoft Windows (Computer file)*” subject heading to this module is because the module mainly discusses network security issues in relation to MS-Windows operating system.

<b>Syllabus No. 3</b>	
<b>Module Title</b>	<b>Networking and Security Management</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>● Gain an in-depth knowledge of normal and abnormal network patterns.</li> <li>● Identify vulnerable web applications.</li> <li>● Prevent and Correct vulnerable web applications.</li> <li>● Conversant in wireless security issues and prevention techniques.</li> <li>● Perform approved security audits.</li> </ul> <p>Management of security polices.</p>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201633469	004.62 <b>TP</b>	Interfacing and communications protocols <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ TCP/IP (Computer network protocol)</li> </ul>
0735712654	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer networks -- Security measures</li> <li>▪ Internet -- Security measures</li> </ul>
020163466X	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Firewalls (Computer security)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
1. Data security (005.8)	2	Each SH appears once.	NA

<sup>1</sup> Variant name for protocols: standards

<b>Syllabus No. 4</b>	
<b>Module Title</b>	<b>Applied Networking Fundamentals</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the student with an understanding of Networking Technology fundamentals, models, standards, protocols and communication fundamentals.</li> <li>• Introduces physical implementation, routing algorithms, network management, software interfaces and application.</li> <li>• Explain Networking essentials and describe basic networking hardware.</li> <li>• Configure IOS Devices.</li> <li>• Understand how the TCP/IP model is implemented.</li> <li>• Design an IP addressing scheme to meet design requirements.</li> <li>• Identify and describe the functions of each of the seven layers of the OSI reference model.</li> <li>• Define and describe the function of a MAC address.</li> <li>• Explain the different classes of IP addresses and subnet all classes of networks.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321497708	004.6 <b>TP</b>	Interfacing and communications <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Internet</li> <li>▪ Computer networks</li> </ul>
0072967757	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Data transmission systems</li> <li>▪ Computer networks</li> </ul>
0470068507	004.65 <b>TP</b>	Communications network architecture <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Electronic data processing personnel -- Certification.</li> <li>▪ Computer networks -- Examinations -- Study</li> </ul>
	004.62 <b>FN</b>	Interfacing and communications protocols	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Interfacing and communications (004.6)	2	Computer networks	2

<sup>1</sup> Class here data communications; internetworking, interoperability; interdisciplinary works on computer communications.

<sup>2</sup> Class here systems analysis, design, topology (configuration) of computer communications networks

<b>Syllabus No. 5</b>	
<b>Module Title</b>	<b>Network Management</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the student with an understanding of how to select, connect, configure and troubleshoot a network.</li> <li>• Knowledge of networks in terms of physical implementation, protocols, routing algorithms, management, software interfaces and application will also be explored.</li> <li>• Describe the underlying principles in a modern day communication system.</li> <li>• Evaluate and implement LAN and WAN technologies currently available.</li> <li>• Understand the LAN switching operation and configuration.</li> <li>• Implement LAN design requirements and spanning tree protocol.</li> <li>• Explain Virtual LANs, Trunking and VTP.</li> <li>• Explain the different classes of IP addresses and subnet all classes of networks.</li> <li>• Configure access control lists and define access rules.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0133499456	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks</li> </ul>
0131856448	004..22 <b>FP</b>	Computer architecture	<ul style="list-style-type: none"> <li>▪ Computer organization.</li> <li>▪ Computer architecture.</li> </ul>
158720083X	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Electronic data processing personnel --Certification.</li> <li>▪ Computer network protocols -- Study guides.</li> <li>▪ Internetworking (Telecommunication) – Study guides.</li> </ul>
	004.65 <b>FN</b>	Communications network architecture <sup>1</sup>	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
1. Interfacing and communications (004.6)	2	Each SH appears once.	NA

<sup>1</sup> Class here systems analysis, design, topology (configuration) of computer communications networks

<b>Syllabus No. 6</b>	
<b>Module Title</b>	<b>Network Data Communications</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the learner with an understanding of the fundamentals of data communication and networking.</li> <li>• Introduce the learner to reference and implementation network models and their associated standards and protocols.</li> <li>• Relay the importance of security and the essential understanding of protected communication.</li> <li>• Measure and describe the characteristics of electricity.</li> <li>• Describe the function and features of CPUs, memory.</li> <li>• Define interrupt, IRQ, I/O address, DMA and base memory address.</li> <li>• Perform operating system maintenance, configuration &amp; file security.</li> <li>• List and identify the elements of the OSI reference and implementation of TCP/IP.</li> <li>• Identify networking protocols and standards.</li> <li>• Discuss the concepts behind basic security.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
020142293X	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Data transmission systems.</li> <li>▪ Computer networks.</li> </ul>
0130843709	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Data transmission systems.</li> <li>▪ Computer networks.</li> </ul>
0072967757	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Data transmission systems.</li> <li>▪ Computer networks.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Interfacing and communications (004.6)	3	Data transmission systems.	3
		Computer networks	3

<b>Syllabus No. 7</b>	
<b>Module Title</b>	<b>Applied Server Management</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Choose appropriate application models based on the planned usage.</li> <li>• Identify the activities performed while planning server installation.</li> <li>• Match the features of RAID/SCSI/IDE with their associated benefits.</li> <li>• Identify the accessories required for a rack-mounted server setup.</li> <li>• Install network monitor and backup software.</li> <li>• Demonstrate the steps involved in upgrading BIOS, processor and Hard Disks.</li> <li>• Troubleshoot server problematic issues.</li> <li>• Identify the benefits of clustering.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0471316156	004.36 <b>TP</b>	Distributed processing <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Client/server computing.</li> </ul>
0130225347	005.71 <b>TP</b>	Data communications <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Web servers.</li> <li>▪ Computer networks -- Security measures.</li> </ul>
0764548093	005.7585 <b>TP</b>	Specific distributed database management systems	<ul style="list-style-type: none"> <li>▪ Electronic data processing personnel -- Certification.</li> <li>▪ Client/server computing -- Certification -- Study guides.</li> <li>▪ Web servers -- Certification -- Study guides.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Including systems analysis and design, computer architecture, performance evaluation of distributed computer systems

<sup>2</sup> Class here computer communications; device drivers, interfacing



<b>Syllabus No. 8</b>	
<b>Module Title</b>	<b>Networking Clients 1</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Conversant in operating system theory and components.</li> <li>• Manage and configure open source services.</li> <li>• Design, plan, and implement large-scale deployment of networked clients.</li> <li>• Networking management and routing protocols.</li> <li>• Investigate virtualisation technology.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0130661023	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks</li> </ul>
0201633469	004.62 <b>TP</b>	Interfacing and communications protocols	<ul style="list-style-type: none"> <li>▪ TCP/IP (Computer network protocol)</li> </ul>
0131963694	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> <li>▪ Computer networks -- Security measures.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 9</b>	
<b>Module Title</b>	<b>Networking Clients 2</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Conversant in current networking protocols.</li> <li>• Practical ability to maintain and optimise network client systems.</li> <li>• Configure networking within a client context.</li> <li>• Configure intra-network security.</li> <li>• Implement user account security.</li> <li>• Configure post-installation system settings.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0596002971	004.62 <b>TP</b>	Interfacing and communications protocols	<ul style="list-style-type: none"> <li>▪ TCP/IP (Computer network protocol)</li> </ul>
0596529597	005.446 <b>FP</b>	Microcomputers--operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> <li>▪ Microsoft Windows (Computer file)</li> </ul>
0735623902	005.446 <b>FP</b>	Microcomputers--operating systems	<ul style="list-style-type: none"> <li>▪ Microsoft software -- Examinations – Study guides.</li> <li>▪ Electronic data processing personnel -Certification.</li> <li>▪ Operating systems (Computers) -- Installation.</li> <li>▪ Microsoft Windows (Computer file)</li> </ul>
020163466X	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Firewalls (Computer security)</li> </ul>
9780764577048	005.446 <b>FP</b>	Microcomputers--operating systems	<ul style="list-style-type: none"> <li>▪ Microsoft Windows (Computer file)</li> <li>▪ Operating systems (Computers)</li> </ul>

Unjustified class weights		Unjustified SH weights	
Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Microcomputers--operating systems (005.446)	3	Operating systems (Computers)	3
		Microsoft Windows (Computer file)	3

**NOTE:** the majority of classes and subject heading assigned to this syllabus suggest that the core of this module is about “operating systems”. However as the *aim & objectives* section of the syllabus indicates it is mainly about setting up secured network clients and related issues. Although some of the assigned classes and subject headings are related to the actual subject of the module (networking), the majority are misleading. The reason for the assignment of the highest weights to OS class and related subject headings is because windows Vista OS is used as a platform for teaching networking issues discussed in this module and therefore the majority of referenced books are discussing networking issues in windows Vista and they are classified in the operating systems category. We consider this case a weight-based misclassification.

<b>Syllabus No. 10</b>	
<b>Module Title</b>	<b>Custom Software Development</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the student with an understanding of the practical abilities required for a career in software development.</li> <li>• Introduce the skills required to build new business applications, maintain existing applications, develop cross platform software, develop server side and client side applications and the ability to write scalable software solutions to real world problems.</li> <li>• Demonstrate the ability to plan and control software development using appropriate techniques</li> <li>• Discuss the principles, objectives and problems encountered in developing industry strength software</li> <li>• Develop applications that utilise different software development and deployment frameworks.</li> <li>• Describe and apply software development techniques in the structured analysis of problem domains.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0596008678	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented methods (Computer science)</li> <li>▪ Computer software -- Development.</li> </ul>
3540287132	005.12 <b>TP</b>	Software systems analysis and design <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Software architecture.</li> </ul>
0131857258	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ C# (Computer program language)</li> <li>▪ Computer software -- Development.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Object-oriented programming (005.117)	2	Computer software -- Development.	2

<sup>1</sup> Class here analysis of a user's problem preparatory to developing a software system to solve it

<b>Syllabus No. 11</b>	
<b>Module Title</b>	<b>Database Centred Software Development</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the student with an in-depth understanding of the role played by database management systems in the business software environment.</li> <li>• Development of an appreciation for industry standard database systems and typical software architectures focused on the usage of such systems.</li> <li>• Demonstrate an ability to design and develop software solutions which efficiently utilise database technologies.</li> <li>• Identify and discuss the differing approaches to database design and its impact on the performance of software designed to utilise the database.</li> <li>• Discuss differing database systems including their application sphere.</li> <li>• Deploy database applications to development and production environments</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321181042	<b>NC</b>		
0764549243	005.2762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> <li>▪ Database design.</li> </ul>
0735712123	005.7585 <b>TP</b>	Specific distributed database management systems	<ul style="list-style-type: none"> <li>▪ SQL (Computer program language)</li> <li>▪ MySQL (Electronic resource)</li> <li>▪ Database management.</li> </ul>
0131172611	005.7565 <b>TP</b>	Specific relational database management systems	<ul style="list-style-type: none"> <li>▪ PL/SQL (Computer program language)</li> <li>▪ Oracle (Computer file)</li> <li>▪ Relational databases.</li> </ul>
0596100124	005.756 <b>TP</b>	Relational databases	<ul style="list-style-type: none"> <li>▪ Relational databases.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	1. Relational databases.	2

**NOTE:** As you can see in this case, although each class appears only once but three of these classes are subclasses of the class 005.75 “Specific types of data files and databases”. Similar conditions holds in most of the other cases. This feature can be used when single labelling is required. It also can be used to balance the trade-off between the recall and precision of the classifier.

<b>Syllabus No. 12</b>	
<b>Module Title</b>	<b>Software System Modelling</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Provide the learner with an understanding of the need for the application of a systematic, disciplined and quantifiable approach to the design, development, operation, and maintenance of software.</li> <li>• Familiarise the learner with practical skills to achieve these objectives.</li> <li>• Discuss the principles, objectives and problems in professional software design.</li> <li>• Describe and apply the techniques used in the structured analysis of software related problem domains.</li> <li>• Demonstrate the ability to plan and control software development using appropriate techniques.</li> <li>• Demonstrate an ability to apply different software development methods in light of a problem domain analysis.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0077110005	<b>NC</b>		
0471972088	005.1 <b>TP</b>	Programming <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> </ul>
0321154959	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Software architecture.</li> <li>▪ System design.</li> </ul>
0471329290	005.15 <b>TP</b>	Preparation of program documentation	<ul style="list-style-type: none"> <li>▪ Software configuration management.</li> <li>▪ Anti patterns (Software engineering)</li> </ul>
0201633612	005.12 <b>TP</b>	Software systems analysis and design	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ Computer software -- Reusability.</li> <li>▪ Software patterns.</li> </ul>
0619215267	<b>NC</b>		
0201615770	005.72 <b>FP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Web site development.</li> <li>▪ Application software -- Development.</li> </ul>
0646458418	<b>NC</b>		
0470848499	005.3 <b>TP</b>	Programs <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Software architecture.</li> <li>▪ UML (Computer science)</li> </ul>
0471958697	005.12 <b>TP</b>	Software systems analysis and design	<ul style="list-style-type: none"> <li>▪ Software architecture.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Software systems analysis and design (005.12)	2	Software architecture	3
Programming (005.1)	2		

<sup>1</sup> Class here application programming, software engineering

<sup>2</sup> Software, firmware, middleware

<b>Syllabus No. 13</b>	
<b>Module Title</b>	<b>Relational Database Implementation and Management</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Design and implement secure databases with high availability and disaster recovery.</li> <li>• Demonstrate skills in</li> <li>• Installing and configuring a database server.</li> <li>• Monitoring and troubleshooting database server performance issues.</li> <li>• Constructing SQL queries to query a database and manipulate data.</li> <li>• Understand and describe the role of relational databases in a typical 3 layer web based application architecture.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0596009763	<b>NC</b>		
0130319953	005.74 <b>TP</b>	Data files and databases <sup>1</sup>	Database management.
0072465638	005.74 <b>TP</b>	Data files and databases	Database management.
0596004796	005.7585 <b>TP</b>	Specific distributed database management systems	SQL server. SQL (Computer program language) Client/server computing.
0072225599	005.7565 <b>TP</b>	Specific relational database management systems	SQL (Computer program language) Relational databases.

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Data files and databases (005.74)	2	Database management	2
		SQL (Computer program language)	2

<sup>1</sup> Class here data file processing, data file and database management, database design and architecture

**Syllabus No. 14****Module Title****Advanced Topics in Object Orientated Application Development****Aims & Objectives:**

- Demonstrate the ability to design and implement applications in the context of an application framework.
- Implement applications which make use of system services and threading.
- Display an understanding of, and demonstrate the ability to implement a selection of software design patterns.
- Embed configuration, diagnostic and management capabilities in their applications.
- Understand common security considerations and design secure applications.
- Develop interoperable, component based applications.
- Understand and make use of reflection in their applications.
- Construct internationalisation aware applications.

ISBN	Dewey No.	Dewey Caption	Subject Heading
020189551X	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> </ul>
0321126971	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C# (Computer program language)</li> <li>▪ UML (Computer science)</li> <li>▪ Microsoft .NET</li> <li>▪ Software patterns</li> <li>▪ Object-oriented programming (Computer science)</li> </ul>
0201633612	005.12 <b>TP</b>	Software systems analysis and design	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ Computer software -- Reusability.</li> <li>▪ Software patterns.</li> </ul>
0136291554	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ Computer software -- Development.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
1. Object-oriented programming	2	1. Object-oriented programming (Computer science)	4
		2. Software patterns	2

<b>Syllabus No. 15</b>	
<b>Module Title</b>	<b>Web Based Client Development</b>
<b>Aims &amp; Objectives:</b>	
<ul style="list-style-type: none"> <li>• Display an understanding of how to create and program web applications using best practices.</li> <li>• Demonstrate the ability to create database centric web applications.</li> <li>• Perform tracing, configuring and deployment of web applications.</li> <li>• Display an appreciation for security and authentication concerns applicable to web applications.</li> <li>• Demonstrate an awareness of constraints that apply to the development of web applications for mobile devices.</li> <li>• Demonstrate an understanding of the architecture of web applications.</li> <li>• Appreciate the roll of the presentation layer within the typical 3 layer web application architecture.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
3540009477	005.72 <b>TP</b>	Data preparation and representation, record formats <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Web site development.</li> <li>▪ Web services.</li> <li>▪ World Wide Web.</li> </ul>
0470015543	006.76 <b>TP</b>	Programming <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Web services.</li> <li>▪ Web site development.</li> </ul>
1565925092	004.678 <b>TP</b>	Internet (World Wide Web) <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ Hypertext systems.</li> <li>▪ HTTP (Computer network protocol)</li> </ul>
0596007647	006.74 <b>TP</b>	Markup languages <sup>4</sup>	<ul style="list-style-type: none"> <li>▪ XML (Document markup language)</li> <li>▪ XML. gtt</li> <li>▪ Websites. gtt</li> </ul>
0735623341	<b>NC</b>		

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Web site development	2
		Web services.	2

<sup>1</sup> Including conversion to machine-readable form, data entry and validation; error-correcting codes

<sup>2</sup> Class here Internet programming, web programming

<sup>3</sup> Including extranets, virtual private networks

<sup>4</sup> Class here general document markup languages



<b>Syllabus No. 16</b>	
<b>Module Title</b>	<b>PROGRAMMING FUNDAMENTALS</b>
<p><b>AIM:</b> Equip the learner with the fundamental components and structures of programming.</p> <p><b>LEARNING OUTCOMES:</b></p> <p>On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> <li>• Choose appropriate conditional and iterative constructs for a given programming task.</li> <li>• Design, implement, test and debug a program that uses each of the following: basic computation, simple I/O, conditional and iterative control structures, arrays, strings and functions.</li> <li>• Construct programs modularly from method and functions.</li> <li>• Demonstrate the ability to process Character and Stings.</li> <li>• Declare and manipulate single and multiple-subscript arrays.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0131002252	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0131016210	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0953931013	<b>NC</b>		

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific programming languages (005.133)	2	Java (Computer program language)	2

**NOTE:** since Java programming language is used as a medium to introduce the above listed programming concepts discussed in this course, the “*Specific programming languages*” class, which Java belongs to, has got the highest weight.

<b>Syllabus No. 17</b>			
<b>Module Title</b>	<b>INTERACTIVE DESIGN 1</b>		
<b>Aims &amp; Objectives:</b>			
<ul style="list-style-type: none"> <li>• Define multimedia theories concepts and methods.</li> <li>• Appreciate and apply design principles into the visual communication component of multimedia.</li> <li>• Discuss and critique research information.</li> <li>• Illustrate a solid grounding in the analysis of creative problem solving.</li> <li>• Apply techniques used in interface design.</li> <li>• Describe a range of application areas in multimedia.</li> <li>• Demonstrate technical proficiency using a core set of industry software tools to create interactive media</li> </ul>			

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
007709610X	006.7 <b>TP</b>	Multimedia systems <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Interactive multimedia.</li> </ul>
0827385579	006.76 <b>TP</b>	Programming <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Interactive multimedia.</li> <li>▪ System design.</li> </ul>
0471383414	686.224 <b>TP</b>	Typefaces <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ Graphic design (Typography)</li> </ul>
0321349822	006.686 <b>TP</b>	CorelDRAW	<ul style="list-style-type: none"> <li>▪ Adobe Creative Suite.</li> <li>▪ Computer graphics.</li> <li>▪ Web sites -- Design.</li> <li>▪ Desktop publishing.</li> </ul>
1566091594	<b>NC</b>		

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Interactive multimedia	2

<sup>1</sup> Class here hypermedia, hypertext; web page design; comprehensive works on computer graphics and digital audio, interactive multimedia.

<sup>2</sup> Class here Internet programming, web programming

<sup>3</sup> Design, style, specimens of letters, ornaments, other characters and devices

**Syllabus No. 18****Module Title****MULTIMEDIA TECHNOLOGY 1****AIM:**

On completion of this unit the learner will have a good understanding of a multimedia computer and the role it plays in multimedia technology

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Recognize the different elements of a computer system
- Describe different primary and secondary storage technologies
- Explain the principles of digitization
- Solve simple mathematical problems in Decimal, Binary and Hexadecimal
- Explain the principles of Web Technology

ISBN	Dewey No.	Dewey Caption	Subject Heading
0471310379	006.7 <b>TP</b>	Multimedia systems <sup>1</sup>	Computers. Systems software.
1903337186	006.7 <b>TP</b>	Multimedia systems	Multimedia systems.
0201398184	007.7 <b>CE</b> <b>FP</b>	000 Computer science, information & general works 000 Computer science, knowledge & systems [007] [Unassigned]	Multimedia systems.
1904995098	<b>NC</b>		

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Multimedia systems	2	Multimedia systems	2

**NOTE:** As shown in the above table, one of the referenced books with the ISBN, 0201398184, is classified in 007.7 class. However 007.7 is an unassigned class number in DDC. This is likely to be the result of a data entry error made by cataloguers in the Library of Congress (meant to be 006.7)

<sup>1</sup> Class here hypermedia, hypertext; web page design; comprehensive works on computer graphics and digital audio, interactive multimedia.

<b>Syllabus No. 19</b>	
<b>Module Title</b>	<b>DATABASE SYSTEMS 1</b>
<p><b>AIM:</b></p> <p>This module will provide learners with a practical knowledge to setup and manipulate a relational database.</p> <p><b>LEARNING OUTCOMES:</b></p> <p>On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> <li>• Set up database applications using an appropriate DBMS.</li> <li>• Apply appropriate judgement in setting up a database.</li> <li>• Recognize the importance of database management systems.</li> <li>• The ability to manipulate databases.</li> <li>• Understand the key features of the relational database model.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
1904995098	005.7565 <b>TP</b>	Specific relational database management systems	<ul style="list-style-type: none"> <li>▪ Microsoft Access</li> </ul>
1844450031	005.7565 <b>TP</b>	Specific relational database management systems	<ul style="list-style-type: none"> <li>▪ Microsoft Access.</li> <li>▪ Database management.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific relational database management systems (005.7565)	2	Microsoft Access	2

**Syllabus No. 20****Module Title****PROBLEM-SOLVING TECHNIQUES FOR PROGRAMMERS****AIM:**

This subject aims to provide the learner with an understanding of the issues involved in analysing problems and designing effective and efficient solutions. In addition, the learner will demonstrate a good working knowledge of some common algorithms and data structures.

**LEARNING OUTCOMES:**

On successful completion of this module the student will be able to:

- Demonstrate practical problem-solving and analytical skills.
- Demonstrate knowledge of the logical methodologies of problem-solving.
- Write well-designed algorithms to solve problems which can be translated into Java source code.
- Interpret and extrapolate a number of classical algorithms.
- be able to choose and apply suitable data structures and algorithms for particular problems

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131228072	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer programming.</li> <li>▪ Problem solving -- Data processing.</li> </ul>
0763716340	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer algorithms.</li> </ul>
0763721298	518.1 <b>TP</b>	Algorithms	<ul style="list-style-type: none"> <li>▪ Algorithms.</li> <li>▪ Computational complexity.</li> </ul>
0763730696	<b>NC</b>		
1576761320	<b>NC</b>		

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Programming (005.1)	2	Each SH appears once.	NA

**Syllabus No. 21****Module Title****WEB DEVELOPMENT****AIM:**

The aim of this module is to introduce the learner to the concepts & practice of web development.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Explain & apply the principles of website development.
- Develop simple web pages & websites using only a text editor & HTML code.
- Describe how authoring tools generate HTML & be able to modify & interpret the HTML generated by such authoring tools.
- Design & develop simple web pages & websites using an authoring tool such as Dreamweaver.
- Demonstrate ability in advanced authoring.
- Describe the processes involved in publishing a website.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0761535187	005.276 <b>TP</b>	Programming for distributed computer systems	<ul style="list-style-type: none"> <li>▪ Dreamweaver (Computer file)</li> <li>▪ Web site development.</li> <li>▪ Web sites -- Design.</li> <li>▪ Web sites -- Authoring programs.</li> </ul>
0596001967	005.72 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Web sites -- Design -- Handbooks, manuals, etc.</li> </ul>
0735713847	005.72 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Dreamweaver (Computer file)</li> <li>▪ Web sites -- Design.</li> </ul>
0764534734	005.72 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ HTML (Document markup language)</li> </ul>
	006.74 <b>FN</b>	Markup languages <sup>1</sup>	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
1. Data preparation and representation, record formats (005.72)	3	1. Web sites -- Design.	3
		2. Dreamweaver (Computer file)	2

**NOTE:** At first glance the title of class 005.72, “Data preparation and representation, record formats”, does not seem to be relevant to the core subject of this module which is Web development and HTML. However we searched the LC catalogue for all the items classified into this class and a considerable number of titles in the search results were about web development and related issues. This fact confirms that 005.72 is the right class for this module.

<sup>1</sup> Class here general document markup languages

<b>Syllabus No. 22</b>	
<b>Module Title</b>	<b>COMMUNICATION SKILLS</b>
<b>AIM:</b>	
To provide learners with communication skills appropriate to work in a multi-media environment	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• appreciate the importance of effective communication in different media</li> <li>• communicate correctly in the written medium</li> <li>• use Word and Powerpoint tools effectively</li> <li>• produce documents in appropriate formats</li> <li>• develop skills in verbal communication and presentation</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0717131912	<b>NC</b>		
1403917094	302.2 <b>TP</b>	Communication	▪ Communication
	005.58 <b>FN</b>	Presentation software	
	005.52 <b>FN</b>	Word processing	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Communication (302.2)	1	Communication	1

**Syllabus No. 23****Module Title****OBJECT ORIENTED PROGRAMMING 1****AIM:**

Ensure the learner has the ability to program using object oriented techniques, can develop interfaces and use the java class libraries.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Formulate abstract problem solutions that conform to object oriented principles.
- Construct software in compliance with object oriented techniques.
- Demonstrate the ability to implement effective and efficient error handling.
- Create graphical user interfaces.
- Design and create java applets.

ISBN	Dewey No.	Dewey Caption	Subject Heading
01303451517	<b>NC</b>		
0201360659	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0131201174	<b>NC</b>		
0596002831	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> <li>▪ Web servers.</li> <li>▪ Object-oriented programming (Computer science)</li> </ul>
0201624443	005.11 <b>TP</b>	Special programming techniques	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ Computer software -- Development.</li> </ul>
0953931013	<b>NC</b>		
	005.117 <b>FN</b>	Object-oriented programming	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	2	Java (Computer program language)	2
		Object-oriented programming (Computer science)	2



<b>Syllabus No. 24</b>	
<b>Module Title</b>	<b>INTERACTIVE DESIGN 2</b>
<p><b>AIM:</b> To develop the creative and practical processes in the disciplines involved with multimedia development and study issues related to interactivity and users needs.</p> <p><b>LEARNING OUTCOMES:</b> On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> <li>• Translate and evaluate the visual communication content of interactive multimedia.</li> <li>• Arrange and organise design sequence into creative and comprehensive concepts.</li> <li>• Compare and contrast techniques of interface design.</li> <li>• Define a range of solutions in the area of User Centred Design.</li> <li>• Formulate and critique a range of applications in multimedia.</li> <li>• Demonstrate technical proficiency using a core set of industry software tools to create interactive media.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0827385579	006.76 <b>TP</b>	Programming <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Interactive multimedia.</li> <li>▪ System design.</li> </ul>
0201532581	006.6 <b>TP</b>	Computer graphics	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> </ul>
0201694497	<b>NC</b>		
007709610X	<b>NC</b>		
	006.7 <b>FN</b>	Multimedia systems <sup>2</sup>	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here Internet programming, web programming

<sup>2</sup> Class here hypermedia, hypertext; web page design; comprehensive works on computer graphics and digital audio, interactive multimedia.

<b>Syllabus No. 25</b>	
<b>Module Title</b>	<b>MULTIMEDIA TECHNOLOGY 2</b>
<b>AIM:</b>	
To give learners an understanding of the basic technology for video and audio, and to develop an understanding of different computer operating systems from a theoretical and applied perspective.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• Describe basic video technology.</li> <li>• Describe basic audio technology.</li> <li>• Explain the historical development of computer operating systems.</li> <li>• Describe the key concepts in modern computer operating systems.</li> <li>• Explain the key features of specified operating systems.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0471694665	005.43 <b>TP</b>	Systems programs    Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>
0470858907	006.7 <b>TP</b>	Multimedia systems	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> <li>▪ Digital media.</li> </ul>
0240515870	621.3893 <b>TP</b>	Sound recording and reproducing systems	<ul style="list-style-type: none"> <li>▪ Sound -- Recording and reproducing – Digital techniques.</li> </ul>
0240515862	621.38833 <b>TP</b>	Video recorders and video recordings	<ul style="list-style-type: none"> <li>▪ Digital video</li> </ul>
0201398814	<b>NC</b>		

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 26</b>	
<b>Module Title</b>	<b>DATABASE SYSTEMS 2</b>
<b>AIM:</b>	
This module will provide learners with a detailed knowledge to develop and implement a relational database system for an organisation.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• Use Structured Query Language (SQL) to create and manipulate databases.</li> <li>• Apply normalisation principles to setting up a database.</li> <li>• Design a rational database.</li> <li>• Construct a database for a web site.</li> <li>• Appraise different security threats to a database system.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0321210255	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Database design.</li> <li>▪ Database management</li> </ul>
1403916012	<b>NC</b>		
	005.756 <b>FN</b>	Relational databases	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

**Syllabus No. 27****Module Title****DIGITAL VIDEO AND AUDIO****AIM:**

This course aims to introduce learners to the necessary creative, research and technical skills required to originate and develop digital video and audio material for multimedia.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Describe the key principles of digital video & audio.
- Demonstrate a working knowledge of the modern digital video camera and other digital video & audio technologies.
- Plan, produce, record, edit and prepare digital video & audio for multimedia.
- Demonstrate a good grounding in digital video & audio production and editing procedures for multimedia.
- Use a number of digital editing applications and utilities.
- Within a small team: originate, research, produce and edit a short video sequence, including basic titling, superimpositions and effects for output to multimedia.

ISBN	Dewey No.	Dewey Caption	Subject Heading
1584500980	778.53 <b>TP</b>	Cinematography (Motion picture photography)	<ul style="list-style-type: none"> <li>▪ Digital cinematography -- Handbooks, manuals, etc.</li> <li>▪ Digital video -- Handbooks, manuals, etc.</li> <li>▪ Video recording -- Data processing -- Handbooks, manuals, etc.</li> </ul>
09411188108	<b>NC</b>		
0470858907	006.7 <b>TP</b>	Multimedia systems	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> <li>▪ Digital media.</li> </ul>
0321267931	006.5 <b>TP</b>	Digital audio	<ul style="list-style-type: none"> <li>▪ Adobe Audition.</li> <li>▪ Digital audio editors.</li> </ul>
	006.696 <b>FN</b>	Digital video	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

**Syllabus No. 28****Module Title****WEB DEVELOPMENT AND MULTIMEDIA AUTHORIZING****AIM:**

Macromedia's Flash will be used as a platform for developing key web development and authoring skills. The basic foundations of programming will be introduced to enable learners produce interactive media and utilise the non-linear aspects, which multimedia authoring environments can provide.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Identify the role action script plays in Macromedia's Flash.
- Choose appropriate programming structures for modelling user interaction.
- Write interactions that incorporate pre-existing and customized Components.
- Create interaction between text, images, audio and video elements in Macromedia's Flash.
- Model user interaction that complies with object oriented principles.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0764543032	006.78 <b>TP</b>	Programs <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Flash (Computer file)</li> <li>▪ Computer Animation.</li> <li>▪ Computer graphics.</li> </ul>
0596006527	006.696 <b>TP</b>	Digital video	<ul style="list-style-type: none"> <li>▪ Computer animation.</li> <li>▪ Flash (Computer file)</li> <li>▪ Web sites -- Design.</li> <li>▪ ActionScript (Computer program language)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	<ul style="list-style-type: none"> <li>▪ Flash (Computer file)</li> </ul>	2
		<ul style="list-style-type: none"> <li>▪ Computer Animation</li> </ul>	2

**NOTE:** This is essentially a course on Macromedia's Flash

<sup>1</sup> Class here multimedia authoring programs, software; multimedia software

<b>Syllabus No. 29</b>	
<b>Module Title</b>	<b>SOFTWARE DEVELOPMENT 1</b>
<p><b>AIM:</b> This module will provide learners with a detailed knowledge to develop and implement the policies and strategies required to align investment in IT with the attainment of business goals and objectives.</p> <p><b>LEARNING OUTCOMES:</b> On completion of this unit the learner will :</p> <ul style="list-style-type: none"> <li>• Be able to apply of a leading object-oriented systems development method.</li> <li>• Know the structure and the use of UML</li> <li>• Be able to model systems using a leading CASE tool</li> <li>• Be able to critically analyse approaches to software development.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
080535350X	005.12 <b>TP</b>	Software systems analysis and design	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ User interfaces (Computer systems)</li> </ul>
0201571692	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>
0201360675	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Software engineering</li> <li>▪ UML (Computer science)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	UML (Computer science)	2

<b>Syllabus No. 30</b>	
<b>Module Title</b>	<b>OBJECT ORIENTED PROGRAMMING 2</b>
<p><b>AIM:</b> Further develop the skills acquired in OO Programming 1, acquiring new skills in building dynamic web pages, file and collection processing.</p> <p><b>LEARNING OUTCOMES:</b> On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> <li>• Formulate and implement solutions that encompass collections.</li> <li>• Design and construct dynamic web pages.</li> <li>• Deploy web pages on a web server.</li> <li>• Demonstrate the ability to implement query processing from a web page. Create programs that can read, write and update data from external files</li> </ul> <p><b>SYLLABUS CONTENT:</b></p> <ul style="list-style-type: none"> <li>• <b>Java Collection Framework (JCF)</b> <span style="float: right;"><b>20%</b></span></li> <li>• <b>Dynamic Web Pages</b> <span style="float: right;"><b>60%</b></span></li> <li>• <b>File Processing</b> <span style="float: right;"><b>20%</b></span></li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201360659	005.133 <b>TP</b>	Specific programming languages	▪ Java (Computer program language)
0201624443	005.11 <b>TP</b>	Special programming techniques	▪ Object-oriented programming (Computer science) ▪ Computer software -- Development.
0131201174	<b>NC</b>		
01303451517	<b>NC</b>		
	005.117 <b>FN</b>	Object-oriented programming	
	006.76 <b>FN</b>	Programming <sup>1</sup>	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

**NOTE:** Although 60% of this syllabus focuses on developing dynamic web pages, none of the DDC classes assigned to this syllabus indicate that. This is due to the fact that the books referenced in this syllabus (including the ones that are not catalogued) do not discuss dynamic webpages as their main subject. The referenced books are general Java programming books with a number of chapters about application of Java in creating dynamic web pages (e.g., Java applets, JSP). In this case and a considerable number of other cases that we have examined in our experiment, the titles given to syllabi/modules could be misleading and do not reflect the core subject of the course.

<sup>1</sup> Class here Internet programming, web programming

**Syllabus No. 31****Module Title INTERACTIVE DESIGN 3****AIM:**

The aim of this module is to enable the learner to understand the process by which multimedia projects are managed and developed. Give learners an understanding of usability principles, evaluation methods and accessibility fundamentals. Give learners the creative and technical mastery necessary to design interactive and linear content using various multimedia design elements.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Describe the multimedia development lifecycle.
- Develop effective multimedia development strategies.
- Identify the roles played by the different members of a multimedia project team.
- Relate and apply usability principles to multimedia project work.
- Apply usability testing methods to collect data and test multimedia applications.
- Describe fundamental accessibility issues.
- Through the use of a realistic scenario as a basis for applying multimedia development principles and techniques - have taken a project from problem statement through to build, validation, testing and distribution.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201360586	006.7 <b>TP</b>	Multimedia systems	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> </ul>
0321180968	006.686 <b>TP</b>	CorelDRAW	<ul style="list-style-type: none"> <li>▪ Director (Computer file)</li> <li>▪ Lingo (Computer program language)</li> <li>▪ Multimedia systems.</li> <li>▪ Computer animation.</li> </ul>
155622 9127	<b>NC</b>		
1903337194	005.428 <b>TP</b>	Programming of user interfaces	<ul style="list-style-type: none"> <li>▪ User interfaces (Computer systems)</li> </ul>
0735712018	005.72 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Web sites -- Design -- Standards.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Multimedia systems	2



<b>Syllabus No. 32</b>
<b>Module Title</b>
<b>MULTIMEDIA TECHNOLOGY 3</b>
<b>AIM:</b>
On completion of this unit the learner will have gained an introduction to networking operating systems in local area networks, from both theoretical and applied perspectives
<b>LEARNING OUTCOMES:</b>
On successful completion of this module the learner will be able to:
<ul style="list-style-type: none"> <li>• Install, configure and compare Windows, Linux and Mac OS operating systems</li> <li>• Compare LAN standards</li> <li>• Select placement of network equipment in LAN design</li> <li>• Design and construct simple local area networks</li> </ul>

ISBN	Dewey No.	Dewey Caption	Subject Heading
1562763768	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks.</li> <li>▪ Local area networks (Computer networks)</li> </ul>
0130384887	<b>NC</b>		
0471262722	<b>NC</b>		
1587131102	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks -- Examinations – Study guides.</li> <li>▪ Telecommunications engineers -- Certification.</li> </ul>
	005.446 <b>FN</b>	Microcomputers--operating systems	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Interfacing and communications (004.6)	2	Computer networks	2

**NOTE:** The title of the syllabus is completely irrelevant to its content.

**Syllabus No. 33****Module Title**      **COMPUTER GRAPHICS AND IMAGING 1****AIM:**

To introduce learners to modern computer graphics systems and to give them the understanding of the principles and practice of computer graphics which is required to create high-quality graphic content for multimedia applications.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Apply and assess a range of CG & I techniques.
- Create 2D and 3D multimedia content using CG & I methods.
- Explain the principles and operation of modern computer graphics systems.
- Describe the features of the major formats for 2D, 3D and bitmap graphic content.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0735712433	006.693 <b>TP</b>	Three-dimensional graphics	<ul style="list-style-type: none"> <li>▪ Computer graphics.</li> <li>▪ Three-dimensional display systems.</li> <li>▪ Computer animation.</li> </ul>
047143066	<b>NC</b>		
013159690X	<b>NC</b>		
0321321375	006.66 <b>TP</b>	Programming (child of 006.6 “Computer graphics”)	<ul style="list-style-type: none"> <li>▪ Computer graphics.</li> <li>▪ OpenGL.</li> <li>▪ Interactive computer systems.</li> </ul>
0470858907	006.7 <b>TP</b>	Multimedia systems	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> <li>▪ Digital media.</li> </ul>
0393730832	006.696 <b>TP</b>	Digital video	<ul style="list-style-type: none"> <li>▪ Computer Animation.</li> <li>▪ Three-dimensional display systems.</li> <li>▪ Computer graphics.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Computer graphics	3
		Computer Animation.	2

**Syllabus No. 34****Module Title****SOFTWARE DEVELOPMENT II****AIM:**

To give the learner an understanding of the issues involved in taking a project through the stages from analysis to design, implementation and testing.

**LEARNING OUTCOMES:**

On completion of this unit the learner will:

- Be able to apply and evaluate software cost calculation methods
- Be able to apply formal OO analysis and design methods.
- Be able to describe suitable architectures for multimedia systems
- Be able to discuss the issues in implementing and testing systems.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201571692	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>
0805305947	005.11 <b>TP</b>	Special programming techniques	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> <li>▪ Computer software -- Development -- Management.</li> </ul>
0201309580	005.12 <b>TP</b>	Software systems analysis and design	<ul style="list-style-type: none"> <li>▪ Computer software -- Development -- Management.</li> </ul>
0201360675	005.117 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> <li>▪ UML (Computer science)</li> </ul>
0130890952	006.6 <b>FP</b>	Computer graphics	<ul style="list-style-type: none"> <li>▪ Multimedia systems.</li> <li>▪ System design.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Computer software -- Development -- Management.	2
		UML (Computer science)	2

<b>Syllabus No. 35</b>	
<b>Module Title</b>	<b>ENTERPRISE PROGRAMMING</b>
<b>AIM:</b>	
Provide learners with indebt knowledge of advance programming topics and equip them with the skills necessary to create web tier and wireless applications.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• Demonstrate concurrent, networking and security features of the java programming language.</li> <li>• Write applications that use Java Bean components.</li> <li>• Design and create components that comply with the Java Bean component model.</li> <li>• Design and create web based applications that comply with the J2EE specification.</li> <li>• Write programs that can be deployed on mobile devices.</li> <li>• Compare application development in J2EE with the .NET platform.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0130895601	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0130092290	005.2762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> <li>▪ Web servers.</li> <li>▪ Servlets.</li> <li>▪ JavaServer pages.</li> </ul>
0764543857	005.7126 <b>TP</b>	Microcomputers--communications--programming	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> <li>▪ Computer software -- Development.</li> </ul>
	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ JavaBeans.</li> <li>▪ Java (Computer program language)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific programming languages (005.133)	2	Java (Computer program language)	4

**Syllabus No. 36****Module Title****PROJECT MANAGEMENT AND THE MULTIMEDIA INDUSTRY****AIM:**

The aim of this module is to enable the learner to understand the process by which multimedia projects are managed & to gain an appreciation of the multimedia industry.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Analyse the context of a multimedia project from a management perspective.
- Identify the behaviours necessary to enhance/ influence relationships, interactions, and communications within a multimedia team.
- Distinguish between and appreciate different multimedia project development models and roles.
- Formulate project strategies and plans and demonstrate proficiency in the use of one of the standard network analysis tools currently in the marketplace.
- Select appropriate project management techniques to successfully manage and track projects.
- Demonstrate an appreciation of the professional, ethical and legal issues relating to multimedia development.
- Assess the relevance of various project management principles to a range of multimedia employment scenarios.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201360586	006.7 <b>TP</b>	Multimedia systems	Multimedia systems.
0963917323	343.7309/99 <b>TP</b>	Information storage and retrieval <sup>1</sup> -- United States	<ul style="list-style-type: none"> <li>▪ Multimedia systems Law and legislation United States.</li> <li>▪ Copyright United States.</li> <li>▪ Multimedia systems industry Law and legislation United States.</li> <li>▪ Authors and publishers United States.</li> </ul>
185475825X	343.4170999 <b>TP</b>	Information storage and retrieval -- Republic of Ireland (Eire)	<ul style="list-style-type: none"> <li>▪ Computer networks -- Law and legislation --Ireland.</li> <li>▪ Copyright and electronic data processing --Ireland.</li> <li>▪ Data protection -- Law and legislation -- Ireland.</li> <li>▪ Data transmission systems -- Law and legislation-- Ireland.</li> <li>▪ Computer crimes -- Ireland.</li> </ul>
293015005X	343.09944 <b>TP</b>	Computer communications (law)	<ul style="list-style-type: none"> <li>▪ Internet Law and legislation.</li> </ul>
0201737213	005.1068 <b>TP</b>	Computer programming--management	<ul style="list-style-type: none"> <li>▪ Computer software -- Development -- Management</li> </ul>
0201748061	658.404 <b>TP</b>	Project management	<ul style="list-style-type: none"> <li>▪ Project management.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here comprehensive works on computer law

**Syllabus No. 37****Module Title****MULTIMEDIA TECHNOLOGY 4****AIM:**

On completion of this unit the learner will have gained a theoretical and practical knowledge of the development, design, usage, and management of computer networks using multimedia technologies.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

- Compare network architectures
- Manage local area networks
- Install, configure and manage distributed systems
- Create and manage wired and wireless networks
- Predict emerging trends in multimedia technologies

ISBN	Dewey No.	Dewey Caption	Subject Heading
1562763768	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks.</li> </ul>
0130384887	<b>NC</b>		
1587131102	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Computer networks -- Examinations – Study guides.</li> <li>▪ Telecommunications engineers -- Certification.</li> </ul>
	006.7 <b>FN</b>	Multimedia systems	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Interfacing and communications (004.6)	2	Each SH appears once.	NA

**NOTE:** The title of the module is misleading.

<b>Syllabus No. 38</b>	
<b>Module Title</b>	<b>COMPUTER GRAPHICS AND IMAGING 2</b>
<b>AIM:</b>	
To give learners the necessary mastery of computer graphics and imaging to enable them to produce real time and off-line graphical applications for visualisation and entertainment purposes.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• Apply and assess a wide range of CG &amp; I techniques.</li> <li>• Create multimedia content using CG &amp; I methods.</li> <li>• Analyse problems with existing CG &amp; I methods and propose possible solutions.</li> <li>• Compare and evaluate CG &amp; I techniques.</li> <li>• Formulate solutions to the limitations of some CG &amp; I methods.</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
047143066	<b>NC</b>		
0393730832	006.696 <b>TP</b>	Digital video	Computer Animation. Three-dimensional display systems. Computer graphics.
0735712433	006.693 <b>TP</b>	Three-dimensional graphics	Computer graphics. Three-dimensional display systems. Computer animation.
013159690X	<b>NC</b>		
0321321375	006.66 <b>TP</b>	Programming (computer graphics)	Computer graphics. OpenGL. Interactive computer systems.
0201596237	621.36/7/0285 <b>TP</b>	Technological photography and photo-optics -- Data processing Computer applications	Image processing -- Digital techniques.
0470858907	006.7 <b>TP</b>	Multimedia systems	Multimedia systems. Digital media.
0240515862	621.388/33 <b>TP</b>	Video recorders and video recordings	Digital video.

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	1. Computer graphics.	3
		2. Three-dimensional display systems.	2

<b>Syllabus No. 39</b>	
<b>Module Title</b>	<b>SYSTEMS ARCHITECTURE AND SOFTWARE DEVELOPMENT</b>
<b>AIM:</b> To give a learner an appreciation of System Architectures and the necessity for good architectural design in the development process	
<b>LEARNING OUTCOMES</b> On successful completion of this unit the learner will:	
<ul style="list-style-type: none"> <li>• Be able to evaluate the benefits of studying systems' architectures;</li> <li>• Be able to appraise the different system architectures;</li> <li>• Be able to propose and implement suitable architectures for data processing systems;</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131829572	005.1/1 (Library of Congress) <b>FP</b>	Special programming techniques	<ul style="list-style-type: none"> <li>▪ Software architecture.</li> </ul>
0131829572	004.22 (British Library) <b>TP</b>	Computer architecture	<ul style="list-style-type: none"> <li>▪ Computer software.</li> <li>▪ Computer architecture.</li> <li>▪ Computers Design</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

**NOTE:** This syllabus has referenced only one book and this book is catalogued in both Library of Congress and British Library catalogues. The cataloguers in LoC and BL have classified this book into two different categories. We do not have access to the content of this book and therefore we can not judge to which class the book should belong to. However reading the full syllabus document indicates that this module should be classified into 004.22 "Computer architecture" class.



<b>Syllabus No. 40</b>	
<b>Module Title</b>	<b>HUMAN COGNITION AND COMMUNICATION</b>
<p><b>AIM:</b> To provide learners with knowledge needed to use communication techniques appropriate to diverse audience needs, informed by cognitive theory, in a multi media environment.</p> <p><b>LEARNING OUTCOMES:</b> On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> <li>• understand the needs of different audiences</li> <li>• become competent in the use of appropriate language</li> <li>• choose between different modes of communication, as required</li> <li>• represent information in relevant forms</li> <li>• apply knowledge of cognitive theory to multimedia products</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
1903337135	153 <b>TP</b>	Conscious mental processes and intelligence	<ul style="list-style-type: none"> <li>▪ Cognitive psychology -- Textbooks.</li> </ul>
1841693588	153 <b>TP</b>	Conscious mental processes and intelligence	<ul style="list-style-type: none"> <li>▪ Cognition -- Textbooks.</li> <li>▪ Cognitive psychology -- Textbooks.</li> </ul>
	006.7 <b>FN</b>	Multimedia systems	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Conscious mental processes and intelligence (153)	2	Cognitive psychology -- Textbooks.	2

<b>Syllabus No. 41</b>	
<b>Module Title</b>	<b>E-LEARNING</b>
<b>AIM:</b>	
The aim of this module is to give the learner the knowledge needed to design and produce quality multimedia materials, and critically assess existing material, for e-Learning environments.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ul style="list-style-type: none"> <li>• Apply theories of learning and instruction to a variety of e-learning environments to enhance learning outcomes.</li> <li>• Assess the different processes for Instructional Design for e-Learning.</li> <li>• Critically evaluate existing e-Learning material using models for measuring effectiveness.</li> <li>• Demonstrate an understanding of issues in e-Learning today.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0787960519	658.3/124028 54678 <b>TP</b>	Education and training <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Business education -- Computer-assisted instruction.</li> </ul>
0787951595	658.3/12404 <b>TP</b>	Development and administration of training programs <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Employees -- Training of Planning.</li> <li>▪ Computer-assisted instruction.</li> <li>▪ Instructional systems -- Design.</li> </ul>
0749435119	371.334 <b>TP</b>	Data processing Computer science <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ Internet in education.</li> <li>▪ Computer-assisted instruction.</li> <li>▪ Education Computer network resources.</li> <li>▪ Teaching Computer network resources.</li> </ul>
	374.26 <b>FN</b>	Use of mass media and computers <sup>4</sup>	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Computer-assisted instruction.	2

<sup>1</sup> Class here employee development. Including mentoring

<sup>2</sup> Including evaluation of training programs, selection and training of training personnel, teaching methods

<sup>3</sup> Class here computer-assisted instruction (CAI), electronic programmed instruction

<sup>4</sup> Class here electronic distance education

<b>Syllabus No. 42</b>	
<b>Module Title</b>	<b>Software Process Management</b>
<b>Syllabus Summary</b>	
This module addresses the following concepts: Software Development Models, Software Process Assessment Models, Software Process Improvement Models, Configuration Management, and Metrics and Measurement.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0321154967	005.1/068/5 <b>TP</b>	Computer programming-- production management	<ul style="list-style-type: none"> <li>▪ Capability maturity model (Computer software)</li> <li>▪ Software engineering.</li> </ul>
0201699699	005.1 <b>TP</b>	Programming <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Agile software development.</li> </ul>
020117782X	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ Computer software -- Quality control.</li> </ul>
0136266231	005 <b>TP</b>	Computer programming, programs, data <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> </ul>
0201604442	005.1/4 <b>TP</b>	Verification, testing, measurement, debugging <sup>3</sup>	<ul style="list-style-type: none"> <li>▪ Software measurement.</li> <li>▪ Computer software -- Quality control --</li> <li>▪ Statistical methods.</li> </ul>
0321117425	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> </ul>
020147719X	005.1/068/4 <b>TP</b>	Computer programming-- executive management	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> <li>▪ Teams in the workplace.</li> </ul>
0201548097	005.1/068/4 <b>TP</b>	Computer programming-- executive management	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> </ul>
0321117662	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Software configuration management.</li> <li>▪ Agile software development.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Programming (005.1)	4	Software engineering.	4
Computer programming-- executive management (005.1/068/4)	2	Agile software development.	2
		Computer software -- Development.	2

<sup>1</sup> Class here application programming, software engineering

<sup>2</sup> Class here software compatibility, portability, reliability, reusability

<sup>3</sup> Including software metrics

<b>Syllabus No. 43</b>	
<b>Module Title</b>	<b>Software Design</b>
<b>Syllabus Summary</b>	
<p>This module addresses advanced design techniques within the object-oriented paradigm as well as evaluating emerging technologies and practices in the area. It focuses on the application of software patterns, anti-patterns and emerging areas such as Aspect Oriented Programming.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0201485672	005.1/4 <b>TP</b>	Verification, testing, measurement, debugging	<ul style="list-style-type: none"> <li>▪ Software refactoring.</li> <li>▪ Object-oriented programming (Computer science)</li> </ul>
0130925691	005.1/17 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented methods (Computer science)</li> <li>▪ UML (Computer science)</li> <li>▪ System analysis.</li> <li>▪ System design.</li> </ul>
0321127420	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ System design.</li> <li>▪ Computer architecture.</li> <li>▪ Application software -- Development.</li> <li>▪ Business -- Data processing.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	System design	2

<b>Syllabus No. 44</b>	
<b>Module Title</b>	<b>Entrepreneurship and Intrapreneurship</b>
<p><b>Syllabus Summary</b></p> <p>This module offers a comprehensive overview of entrepreneurship theory and practice. The theory element explores research and readings into the entrepreneurial and intrapreneurial processes within the context of the indigenous and multinational high technology sectors. This is augmented by exposing students to detail on the various functions of a new venture and the writing of a professional business plan for a new high technology product or service.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
1860762557	<b>NC</b>		
061821481X	658.1/141 <b>TP</b>	One-person enterprises-- management--initiation	New business enterprises -- Management. Small business -- Planning. Business planning.
033398465X	<b>NC</b>		
0256234787	658.4/21 <b>TP</b>	Entrepreneurial management	New business enterprises. Entrepreneurship. Business planning. Business enterprises -- Finance. Success in business.
0072971851	<b>NC</b>		
0256197563	658.1/1 <b>TP</b>	Initiation of business enterprises	New business enterprises -- Handbooks, manuals, etc. Entrepreneurship -- Handbooks, manuals, etc.

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Business planning.	2

<b>Syllabus No. 45</b>	
<b>Module Title</b>	<b>Human-Computer Interaction</b>
<p><b>Syllabus Summary</b></p> <p>The syllabus is broken into seven broad areas which present a challenging and thought provoking view of advanced interaction technologies, Human Factors (HF) and Human Information Processing (HIP) issues and discoveries. The central themes of user-centred design (UCD) and usability provide the core of what is considered. Topics are presented in an explorative and open-ended way. This is to encourage exploration and debate. Continuous assessment is oriented towards engaging group discussion, exchange of ideas and reference to User Interface (UI) design experience.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0132398648	004.019 <b>TP</b>	Psychological principles <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Human-computer interaction.</li> </ul>
0201379376	004/.01/9 <b>TP</b>	Psychological principles	<ul style="list-style-type: none"> <li>▪ Human-computer interaction.</li> <li>▪ User interfaces (Computer systems)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Psychological principles (004.19)	2	Human-computer interaction.	2

<sup>1</sup> Class here human-computer interaction, psychological principles and human factors in data processing and computer science, usability

<b>Syllabus No. 46</b>	
<b>Module Title</b>	<b>Distributed Computing</b>
<p><b>Syllabus Summary</b></p> <ul style="list-style-type: none"> <li>• Distributed Computing using OOP</li> <li>• Distributed Web Services</li> <li>• Distributed Systems</li> <li>• Future Trends in Distributed Systems</li> </ul>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0130888931	004/.36 <b>TP</b>	Distributed processing <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Electronic data processing – Distributed processing.</li> <li>▪ Distributed operating systems (Computers)</li> </ul>
0201619180	<b>NC</b>		
047149691X	006.3 <b>TP</b>	Artificial intelligence <sup>2</sup>	<ul style="list-style-type: none"> <li>▪ Intelligent agents (Computer software)</li> </ul>
0596004893	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C# (Computer program language)</li> <li>▪ Computer programming.</li> </ul>
1590590252	<b>NC</b>		

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Including systems analysis and design, computer architecture, performance evaluation of distributed computer systems

<sup>2</sup> Class here comprehensive works on artificial intelligence and cognitive science, **intelligent agents**, question-answering systems

<b>Syllabus No. 47</b>	
<b>Module Title</b>	<b>Research Methods and Professional Practice</b>
<p><b>Syllabus Summary</b></p> <p>Research project management from concept to completion and publication stage. Design and evaluation of research methodologies; Qualitative, Quantitative and Mixed Mode research methodologies. The student will apply the knowledge of research methods obtained in this module in the Research Project module. The increasing significance of certification and professional development will be explored.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0761965920	001.4/2 <b>TP</b>	Research methods <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Social sciences -- Research -- Methodology.</li> <li>▪ Education -- Research -- Methodology.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

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<sup>1</sup> Class here scientific method



<b>Syllabus No. 48</b>	
<b>Module Title</b>	<b>High Performance Computing</b>
<b>Syllabus Summary</b>	
High performance computing technology - hardware and software, including areas such as performance optimisation, application characterisation and parallel programming.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
156592312X	004.2/56 <b>FP</b>	Microcomputers--architecture	Computer architecture. Electronic digital computers. Parallel processing (Electronic computers). Supercomputers.
0262571323	005.2/75 <b>TP</b>	Programming for multiprocessor computers <sup>1</sup>	Parallel programming (Computer science) Parallel computers -- Programming. Computer interfaces.
1558608710	004.35 <b>TP</b>	Multiprocessing <sup>2</sup>	Parallel processing (Electronic computers)

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Parallel processing (Electronic computers).	2

<sup>1</sup> Class here concurrent, parallel programming

<sup>2</sup> Including systems analysis and design, computer architecture, performance evaluation of multiprocessor computers; array processing, associative processing, dataflow computation. Class here massively parallel supercomputers, parallel processing

**Syllabus No. 49****Module Title****Mobile Computing****Syllabus Summary:**

The module addresses the architecture and networking technology underlying mobile computing systems. It will focus on current research issues such as Ad-hoc networking Quality of Service, Mobile Databases, Simulation and Performance, Mobile Internet Access Pervasive Computing, Sensor Networks, and Multimedia amongst others.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321123816	621.382 <b>TP</b>	Communications engineering <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Mobile communication systems.</li> <li>▪ Wireless communication systems.</li> </ul>
0130422320	621.382 <b>TP</b>	Communications engineering	<ul style="list-style-type: none"> <li>▪ Wireless communication systems.</li> <li>▪ Mobile communication systems.</li> <li>▪ Telecommunication systems.</li> </ul>
0201733544	384.5 <b>TP</b>	Wireless communication	<ul style="list-style-type: none"> <li>▪ Personal communication service systems.</li> <li>▪ Wireless communication systems.</li> <li>▪ Wireless Internet.</li> <li>▪ Internet programming.</li> <li>▪ Application software.</li> </ul>
0471394920	621.3845 <b>FP</b>	Radiotelephony	<ul style="list-style-type: none"> <li>▪ Wireless communication systems.</li> <li>▪ Mobile communication systems.</li> <li>▪ Personal communication service systems.</li> <li>▪ Telecommunication -- Switching systems.</li> </ul>
0792379985	621.3845 <b>FP</b>	Radiotelephony	<ul style="list-style-type: none"> <li>▪ Mobile communication systems.</li> </ul>
0792386108	006.3 <b>FP</b>	Artificial intelligence	<ul style="list-style-type: none"> <li>▪ Mobile computing.</li> </ul>
0130408646	621.382 <b>TP</b>	Communications engineering	<ul style="list-style-type: none"> <li>▪ Wireless communication systems.</li> <li>▪ Wireless LANs.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Communications engineering (621.382)	3	Wireless communication systems.	5
Radiotelephony (621.3845)	2	Mobile communication systems.	4

<sup>1</sup> Class here analog, digital, electronic communications; telecommunications; comprehensive works on digital data and telecommunications engineering

<b>Syllabus No. 50</b>	
<b>Module Title</b>	<b>Enterprise Information Architectures</b>
<p><b>Syllabus Summary:</b></p> <p>This module offers a comprehensive examination of modern networked information architectures paradigms and the latest practices and trends relating to the management of large enterprise data centres. A large percentage of this module is centred on the evolving developments in the area in recent years and the emerging technologies in this field.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0072130725	004.6 <b>TP</b>	Interfacing and communications	<ul style="list-style-type: none"> <li>▪ Storage area networks (Computer networks)</li> <li>▪ Database management.</li> <li>▪ File organization (Computer science)</li> <li>▪ Computer storage devices.</li> </ul>
0130284165	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Storage area networks (Computer networks)</li> <li>▪ Database management.</li> <li>▪ File organization (Computer science)</li> </ul>
1565922492	005.4/26 <b>TP</b>	File system management programming	<ul style="list-style-type: none"> <li>▪ Microsoft Windows NT.</li> <li>▪ Operating systems (Computers)</li> <li>▪ File organization (Computer science)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	File organization (Computer science)	3
		Database management.	2
		Storage area networks (Computer networks)	2

<b>Syllabus No. 51</b>	
<b>Module Title</b>	<b>Visualisation</b>
<p><b>Syllabus Summary:</b></p> <p>This module builds on the students' knowledge of Computer Graphics and fundamental Mathematics developing conceptual and practical skills in the areas of visualisation principles and techniques and mathematical modelling and computer representation of complex phenomena. Current and emerging trends in the development and application of computer visualisation will also be examined.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0201596261	<b>NC</b>		
0961392142	001.4/226 <b>TP</b>	Presentation of statistical data <sup>1</sup>	Statistics -- Graphic methods
0122277384	006.6 <b>TP</b>	Computer graphics	Computer graphics. Visualization.

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here graphic presentation

<b>Syllabus No. 52</b>	
<b>Module Title</b>	<b>Document Engineering</b>
<p><b>Syllabus Summary</b></p> <p>This module builds on the established principles of information storage and retrieval. Its focus centres on the widespread adoption of Extensible Markup Language (XML), with its ability to define formal structural and semantic components of electronic documents. The theory and practice of document modelling are explored and a number of cutting-edge research areas will be explored.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
020139829X	025.04 <b>TP</b>	Information storage and retrieval systems	<ul style="list-style-type: none"> <li>▪ Information storage and retrieval systems.</li> </ul>
0201771683	005.7/2 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ XML (Document markup language)</li> </ul>
0471085863	005.2/76 <b>FP</b>	Programming for distributed computer systems	<ul style="list-style-type: none"> <li>▪ Web site development.</li> <li>▪ Web sites -- Design.</li> <li>▪ Web publishing.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 53</b>	
<b>Module Title</b>	<b>Project Management</b>
<b>Syllabus Summary</b>	
A comprehensive course on current Software Project Management techniques. Students will learn how to manage risk and change in a project. The course reviews the research and papers of experienced project managers.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0619035285	658.404 <b>TP</b>	Project management	<ul style="list-style-type: none"> <li>▪ Project management.</li> <li>▪ Information technology Management.</li> </ul>
007709834X	005.1 <b>FP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Software engineering.</li> <li>▪ Project management.</li> </ul>
0201498340	005.1/17 <b>FP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Object-oriented methods (Computer science)</li> <li>▪ Computer software -- Development.</li> </ul>
0195100107	658.406 <b>FP</b>	Managing change	<ul style="list-style-type: none"> <li>▪ Industrial management.</li> <li>▪ Technological innovations.</li> <li>▪ Creative ability in business.</li> <li>▪ Organizational change.</li> </ul>
	005.1068 <b>FN</b>	Computer programming-- management	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Project management	2

<b>Syllabus No. 54</b>	
<b>Module Title</b>	<b>MATHEMATICS 1</b>
<b>AIM:</b>	
To develop an analytical approach to problem solving in a modern computing environment	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Perform fundamental computing arithmetic operations in different number systems.</li> <li>2. Use discrete mathematical tools in sets, relations, logic and functions to model and solve problems.</li> <li>3. Solve systems of linear equations using matrix algebra.</li> <li>4. Demonstrate an adequate understanding of graph theory and its applications to data structures.</li> <li>5. Apply probability distributions to model and solve practical problems.</li> <li>6. Use Excel to perform numerical, statistical and graphical analyses of data.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131277677	510 <b>TP</b>	Mathematics	<ul style="list-style-type: none"> <li>▪ Mathematics.</li> <li>▪ Computer science -- Mathematics.</li> </ul>
0071167560	<b>NC</b>		
0134888014	519.5 <b>TP</b>	Statistical mathematics	<ul style="list-style-type: none"> <li>▪ Engineering -- Statistical methods – Data processing.</li> <li>▪ Microsoft Excel (Computer file)</li> <li>▪ Minitab.</li> <li>▪ Electronic spreadsheets.</li> </ul>
	004.0151 <b>FN</b>	Mathematical principles <sup>1</sup>	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here computer mathematics

**Syllabus No. 55****Module Title****COMPUTER SYSTEMS & OPERATING SYSTEMS****AIM:**

To provide an overview of the structures and functions of the component parts of a computer system and to introduce operating system design concepts.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Describe the structures and functions of the component parts of a computer system.
2. Describe and use the common features of an operating system.
3. Use the monitoring tools of an operating system.
4. Design batch files for system admin. procedures.
5. Set up day-to-day system management tasks.
6. Write and test basic Unix shell script programs.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131278371	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>
0130351199	004.2/2 <b>TP</b>	Computer architecture	<ul style="list-style-type: none"> <li>▪ Computer organization.</li> <li>▪ Computer architecture.</li> </ul>
0534376665	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Systems programs Operating systems (005.43)	2	Operating systems (Computers)	2



<b>Syllabus No. 56</b>	
<b>Module Title</b>	<b>PROGRAMMING</b>
<b>AIM:</b>	
To provide an introduction to the discipline, methodologies and techniques of computer programming using a modern programming language.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to :	
<ol style="list-style-type: none"> <li>1. Apply the concepts of computer programming in the development of programming solutions to problems.</li> <li>2. Select appropriate programming constructs for use in programs.</li> <li>3. Define and implement abstract data types as representations of real world data.</li> <li>4. Design and implement programs that instantiate and manipulate objects of defined abstract data types.</li> <li>5. Work co-operatively in groups in the development of software applications.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0717131726	<b>NC</b>		
0201721481	005.13/3 <b>TP</b>	Specific programming languages	C++ (Computer program language)
0131118811	<b>NC</b>		
	005.1 <b>FN</b>	Programming	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

**NOTE:** C++ is used as a medium to introduce programming basics.

<b>Syllabus No. 57</b>	
<b>Module Title</b>	<b>WEB DESIGN</b>
<b>AIM:</b>	
To provide an understanding of Internet technology and the skills required to develop, deploy and manage a web site.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Demonstrate his/her expert knowledge and understanding of Web page technology.</li> <li>2. Identify and assess best practice design in relation to Web pages.</li> <li>3. Plan and manage all aspects related to creation and deployment of an information Web site.</li> <li>4. Demonstrate his/her Web page development skills.</li> <li>5. Utilize state of the art Web publishing and content management software.</li> <li>6. Demonstrate his/her ability to design, implement, test and deploy a Web page to meet project defined deliverables.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0975240234	<b>NC</b>		
0596004842	<b>NC</b>		
0789729733	004.67/8 <b>TP</b>	Internet (World Wide Web)	<ul style="list-style-type: none"> <li>▪ Internet -- Popular works.</li> </ul>
9780764579080	005.2/762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ Web site development.</li> <li>▪ JavaScript (Computer program language)</li> </ul>
0072229535	005.7/2 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Web site development.</li> <li>▪ Web sites -- Design.</li> <li>▪ Web sites -- Authoring programs.</li> <li>▪ Web publishing.</li> </ul>
	070.57973 <b>FN</b>	Web publications <sup>1</sup>	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Web site development.	2

<sup>1</sup> Class here Internet publishing

**Syllabus No. 58****Module Title****DATABASE MANAGEMENT SYSTEMS****AIM:**

To develop the knowledge, understanding and skills necessary to design and implement relational databases

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Demonstrate a detailed understanding of the theory of database models with particular emphasis on the relational model.
2. Implement relational databases using a leading DBMS.
3. Design and execute SQL code to interact with a relational database.
4. Utilise analysis and design methodologies to develop relational database schema.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321210255	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Database design.</li> <li>▪ Database management.</li> </ul>
0321122267	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Database management.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Data files and databases	2	Database management.	2

<b>Syllabus No. 59</b>	
<b>Module Title</b>	<b>MATHEMATICS 2</b>
<b>AIM:</b>	
To develop further the mathematical skills essential to the study of computing	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will :	
<ol style="list-style-type: none"> <li>1. Have developed a clear understanding how quantitative methods in the algebraic, statistical and operational research fields can be applied to problems encountered in a modern computing environment.</li> <li>2. Be able to carry out a simulation study of a process from accumulating data to analyzing results using Microsoft Excel.</li> <li>3. Be proficient in a variety of mathematical concepts and techniques which are employed in computer-graphics algorithms.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131277677	<b>NC</b>		
0071167560	<b>NC</b>		
0134888014	519.5 <b>TP</b>	Statistical mathematics	<ul style="list-style-type: none"> <li>▪ Engineering -- Statistical methods – Data processing.</li> <li>▪ Microsoft Excel (Computer file)</li> <li>▪ Minitab.</li> <li>▪ Electronic spreadsheets.</li> </ul>
	004.0151 <b>FN</b>	Mathematical principles <sup>1</sup>	<ul style="list-style-type: none"> <li>▪</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here computer mathematics

<b>Syllabus No. 60</b>	
<b>Module Title</b>	<b>COMPUTER NETWORKS &amp; SYSTEMS</b>
<b>AIM:</b>	
To provide an understanding of the theory, concepts and methods applicable to the fields of computer networks, systems and computer security.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Define the functionality of LANs and WANs and outline common LAN/WAN standards.</li> <li>2. Identify and define the uses of different LAN/WAN networking devices.</li> <li>3. Understand the different classes and parts of an IP address.</li> <li>4. Build and configure a LAN.</li> <li>5. Compare and contrast various types of scheduling algorithms.</li> <li>6. Understand the core functional aspects of a UNIX system.</li> <li>7. Write and test Unix shell scripts.</li> <li>8. Describe basic cryptographic principles.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0130863882	<b>NC</b>		
0130384887	<b>NC</b>		
1565920015	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> <li>▪ UNIX System V (Computer file)</li> <li>▪ Solaris (Computer file)</li> </ul>
1596002610	<b>NC</b>		
	004.6 <b>FN</b>	Interfacing and communications	
	005.8 <b>FN</b>	Data security	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 61</b>	
<b>Module Title</b>	<b>OBJECT ORIENTED PROGRAMMING</b>
<b>AIM:</b>	
To provide the capability to develop desktop GUI-based applications using the Object Oriented paradigm	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Describe and analyse the use of the Object Oriented Programming paradigm in the implementation of applications.</li> <li>2. Define and implement class hierarchies as representations of 'is a kind of' relationships between objects.</li> <li>3. Design and construct user interfaces applying appropriate HCI and usability criteria.</li> <li>4. Design and build GUI-based applications using an Object Oriented class framework.</li> <li>5. Select appropriate software architectures for solutions for specific applications.</li> <li>6. Interact effectively in a team setting in the implementation of an assigned software development project.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0717131726	<b>NC</b>		
0131118811	<b>NC</b>		
0782122736	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Microsoft Visual C++.</li> </ul>
0201721481	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> </ul>
0789724669	005.2/768 <b>FP</b>	Distributed processing-- programming--specific operating systems	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Microsoft Visual C++.</li> <li>▪ Microsoft .NET.</li> </ul>
	005.117 <b>FN</b>	Object-oriented programming	

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	2	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> </ul>	2
		<ul style="list-style-type: none"> <li>▪ Microsoft Visual C++.</li> </ul>	2

**NOTE:** C++ is used as a medium to introduce OO concepts.

**Syllabus No. 62****Module Title****COMPUTER SCIENCE I****AIM:**

To provide an understanding of the essential characteristics of basic recursive algorithms and dynamic data structures.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Design and implement basic recursive functions.
2. Identify problems that are better suited to being programmed recursively.
3. Choose and apply suitable data structures and algorithms for particular problems.
4. Create and manipulate dynamic data structures such as linked lists, stacks, queues and binary trees.
5. Explain conceptually the differences between the various sorting and searching algorithms.
6. Demonstrate an ability to implement these algorithms in C++.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0201510596	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> </ul>
0135791782	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Computer algorithms.</li> </ul>
0201702975	005.7/3 <b>TP</b>	Data structures	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Data structures (Computer science)</li> <li>▪ Object-oriented programming (Computer science)</li> </ul>

Unjustified class weights		Unjustified SH weights	
Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	2	C++ (Computer program language)	3

**NOTE:** The “data structure” class should have been assigned the highest weight.

**Syllabus No. 63****Module Title****SOFTWARE DEVELOPMENT****AIM:**

To provide an in-depth understanding of software engineering, software testing and prototyping in the context of the Object Oriented paradigm.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Explain and analyse OO concepts and software engineering principles in the context of OO software development.
2. Develop a range of UML diagrams and carry out structural and behavioural modelling demonstrating use of a CASE tool for diagram development.
3. Participate effectively in an OO case study which requires iterative and incremental UML diagram development where learners will work both in teams and individually.
4. Describe and analyse software prototyping and apply this in the development screen prototypes for a system.
5. Describe and analyse software testing and apply this conducting functional and structural software testing.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0471358460	<b>NC</b>		
0442206720	005.1/4 <b>TP</b>	Verification, testing, measurement, debugging	<ul style="list-style-type: none"> <li>▪ Computer software -- Testing.</li> </ul>
0136298419	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (computer science)</li> <li>▪ System design.</li> </ul>
0201571684	005.1/17 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Each SH appears once.	NA



**Syllabus No. 64****Module Title****DATABASE SYSTEMS****AIM:**

To provide a comprehensive knowledge and experience of the administration and programming methodologies required for effective implementation of relational database systems using an enterprise Database Management System as well as an appreciation of the future trends within database technology.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Have a systematic understanding of current theoretical and technical knowledge employed in the role of Database Administrator (DBA).
2. Describe and implement the security and recovery functions of a DBMS.
3. Utilise a wide variety of applications and web programming interfaces to DBMS.
4. Be capable of carrying out the analysis, design, planning and implementation of relational database systems.
5. Discuss future trends of database technology and data applications.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321210239	<b>NC</b>		
0201708574	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Database design.</li> <li>▪ Database management.</li> </ul>
0130648396	005.74 <b>TP</b>	Data files and databases	<ul style="list-style-type: none"> <li>▪ Database management.</li> </ul>
0596000413	005.2/762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ MySQL (Electronic resource)</li> <li>▪ PHP (Computer program language)</li> <li>▪ Web sites -- Design.</li> </ul>
0596000413	005.2/762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ MySQL (Electronic resource)</li> <li>▪ PHP (Computer program language)</li> <li>▪ Web sites -- Design.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Data files and databases (005.74)	2	Database management.	2
Distributed processing--programming--specific programming languages (005.2/762)	2	MySQL (Electronic resource)	2
		PHP (Computer program language)	2
		Web sites -- Design.	2

<b>Syllabus No. 65</b>	
<b>Module Title</b>	<b>JAVA TECHNOLOGIES</b>
<b>AIM:</b>	
To provide the capability to program using the advanced features of Java in order to develop comprehensive networked projects.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Deploy appropriate theory, practices and tools for the implementation of robust Java solutions.</li> <li>2. Select and implement measures to manage and process large quantities of data.</li> <li>3. Critically evaluate client/server applications.</li> <li>4. Select and implement appropriate Java-based technologies to develop Web-Based applications.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131489526	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0131483986	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>
0596007213	005.2/762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ Internet programming</li> <li>▪ Java (Computer program language)</li> </ul>
0131872486	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ Java (Computer program language)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	3	Java (Computer program language)	4

<b>Syllabus No. 66</b>	
<b>Module Title</b>	<b>COMPUTER SCIENCE II</b>
<b>AIM:</b>	
To provide an understanding of the underlying concepts in the analysis of algorithms and to improve problem solving skills through the further study of data structures.	
<b>LEARNING OUTCOMES:</b>	
On successful completion of this module the learner will be able to:	
<ol style="list-style-type: none"> <li>1. Analyse and classify various algorithms using the Big-Oh notation.</li> <li>2. Explain conceptually how the basic Search, Insertion and Deletion operations are implemented with AVL Trees, Tries and B-Trees.</li> <li>3. Demonstrate an ability to create and manipulate these data structures in C++.</li> <li>4. Represent Multi-way Trees and Orchards as Binary Trees and vice versa.</li> <li>5. Explain the differences between the common traversal and shortest path algorithms in weighted graphs at an abstract level.</li> <li>6. Demonstrate an ability to implement these algorithms in C++.</li> </ol>	

ISBN	Dewey No.	Dewey Caption	Subject Heading
0137256493	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> </ul>
0201510596	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> </ul>
0135791782	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Computer algorithms.</li> <li>▪ Data structures (Computer science)</li> </ul>
0763704814	005.7/3 <b>TP</b>	Data structures	<ul style="list-style-type: none"> <li>▪ C++ (Computer program language)</li> <li>▪ Data structures (Computer science)</li> </ul>

Unjustified class weights		Unjustified SH weights	
Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	3	C++ (Computer program language)	3
Data structures (005.7/3)	1	Data structures	2

**NOTE:** The “data structure” class and related subject headings should have been assigned the highest weight. In this course C++ programming language is used as a medium to introduce data structure concepts.

**Syllabus No. 67****Module Title****OBJECT MODELLING AND DESIGN****AIM:**

To provide the capability to carry out UML model development and refinement in support of a phased software development activity utilising a leading Object Oriented systems development methodology.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Appraise and explain the unified process and the role of software engineering and demonstrate application of these areas in the development of their 3rd year software engineering team project.
2. Assess and explain requirements elicitation and analysis and be able to conduct requirements elicitation and analysis activities and develop and refine the associated UML models.
3. Assess and explain system and object design and be able to conduct system design and object design activities and develop and refine the associated UML models.
4. Be able to apply the OO iterative and incremental approach to system development and demonstrate application of requirements elicitation, analysis and design to their 3rd year software engineering team project. (The software engineering project is a separate module in year 3)

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131911791	<b>NC</b>		
0321321278	005.1/1 <b>TP</b>	Special programming techniques	<ul style="list-style-type: none"> <li>▪ Object-oriented methods (Computer science)</li> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>
0201571684	005.1/17 <b>TP</b>	Object-oriented programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>
0201571692	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer software -- Development.</li> <li>▪ UML (Computer science)</li> </ul>
0805353402	005.11 <b>TP</b>	Special programming techniques	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (Computer science)</li> </ul>
0136298419	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Object-oriented programming (computer science)</li> <li>▪ System design.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Special programming techniques (005.1/1)	2	Computer software -- Development.	3
Programming	2	UML (Computer science)	3
		Object-oriented programming (computer science)	2

**Syllabus No. 68****Module Title****WEB APPLICATIONS****AIM:**

To provide an understanding of Web applications technology and the skills required to develop, deploy and manage a comprehensive web site using cutting-edge technology.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Demonstrate an expert knowledge and understanding of Web application technology.
2. Identify and assess best practice design in relation to Web applications.
3. Plan and manage all aspects related to creation and deployment of a Web application.
4. Demonstrate web application development skills.
5. Utilize state of the art web application publishing and content management software.
6. Demonstrate ability to design, implement, test and deploy a Web Application to meet project defined deliverables.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321223675	<b>NC</b>		
0596003803	005.75/8 <b>TP</b>	Distributed data files and databases	<ul style="list-style-type: none"> <li>▪ ColdFusion.</li> <li>▪ Web databases.</li> <li>▪ Database design.</li> </ul>
0735713200	005.7/2 <b>TP</b>	Data preparation and representation, record formats	<ul style="list-style-type: none"> <li>▪ Dreamweaver (Computer file)</li> <li>▪ Web site development.</li> </ul>
0672324385	005.2/762 <b>TP</b>	Distributed processing--programming--specific programming languages	<ul style="list-style-type: none"> <li>▪ JavaServer pages.</li> <li>▪ Web sites -- Design.</li> <li>▪ Web site development.</li> <li>▪ Servlets.</li> </ul>
1593270119	006.7/6 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Web sites -- Design.</li> <li>▪ Internet programming.</li> <li>▪ HTML (Document markup language</li> </ul>
013140265X	658.8/4 <b>FP</b>	Export marketing	<ul style="list-style-type: none"> <li>▪ Electronic commerce -- Handbooks, manuals, etc.</li> </ul>
1578203120	658.8/72 <b>TP</b>	Telemarketing and direct marketing	<ul style="list-style-type: none"> <li>▪ Electronic commerce.</li> <li>▪ Business enterprises -- Computer networks.</li> <li>▪ Internet marketing.</li> <li>▪ Web sites -- Design.</li> <li>▪ Internet.</li> <li>▪ World Wide Web.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Each class appears once.	NA	Web site development.	2
		Web sites -- Design	2

**Syllabus No. 69****Module Title****DISTRIBUTED OBJECT BASED SYSTEMS****AIM:**

To provide proficiency in the application of the principles of Object Oriented Programming in a distributed environment and the ability to critically analyse the issues involved in developing a distributed system.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Develop innovative solutions for distributed object based systems using leading methodologies and standards.
2. Identify and analyse criteria in the development and design of a distributed application.
3. Select and implement measures to engender software reuse as well as assessing how the object paradigm might be introduced through technology transfer.
4. Demonstrate a critical comprehension of the impact that Internet technologies are having on the development of distributed systems.

- DISTRIBUTED OBJECT BASED COMPUTING. 25%
- JAVA DISTRIBUTED TECHNOLOGIES 40%
- STANDARDS FOR DEVELOPING DISTRIBUTED SYSTEMS. 10%
- INTERNET TECHNOLOGIES. 25%

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131483986	005.133 <b>TP</b>	Specific programming languages	▪ Java (Computer program language)
3540208666	519.2/4 <b>CE</b> <b>FP</b>	Probability distribution <sup>1</sup>	▪ Distribution (Probability theory)
0321205219	005.133 <b>TP</b>	Specific programming languages	▪ Java (Computer program language) ▪ Web servers. ▪ Internet programming. ▪ Application software -- Development. ▪ Web site development.
	005.276 <b>FN</b>	Programming for distributed computer systems	
	005.117 <b>FN</b>	Object-oriented programming	

Unjustified class weights		Unjustified SH weights	
Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Specific programming languages (005.133)	2	Java (Computer program language)	2

**NOTE:** As shown in the table above the second extracted ISBN is classified into the “Probability distribution” class in DDC. However, reading the title of this book “A theory of distributed objects: asynchrony, mobility, groups, components” indicates that this book has been misclassified by cataloguers in the Library of Congress.

<sup>1</sup> Including binomial distribution, Poisson distribution

**Syllabus No. 70****Module Title****EXPERT SYSTEMS****AIM:**

To provide the knowledge, skills and techniques required to design and develop an expert system. To provide an understanding of knowledge representation techniques and problem solving strategies used in expert systems.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Apply expert systems search and knowledge representation techniques to AI problems.
2. Analyse problems using problem solving strategies.
3. Compare and contrast problem solving strategies.
4. Analyse natural language processing and semantic representation from an AI perspective.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0071008942	<b>NC</b>		
0534384471	<b>NC</b>		
0470848677	006.33 <b>TP</b>	Knowledge-based systems	<ul style="list-style-type: none"> <li>▪ Semantic web.</li> <li>▪ Ontology.</li> </ul>
1852335513	006.33 <b>TP</b>	Knowledge-based systems	<ul style="list-style-type: none"> <li>▪ Expert systems (Computer science)</li> <li>▪ Knowledge management.</li> <li>▪ Semantic Web.</li> </ul>
0596005555	006.3 <b>TP</b>	Artificial intelligence	<ul style="list-style-type: none"> <li>▪ Computer games -- Programming.</li> <li>▪ Video games -- Design.</li> <li>▪ Artificial intelligence.</li> </ul>
0201403757	006.3 <b>TP</b>	Artificial intelligence	<ul style="list-style-type: none"> <li>▪ Artificial intelligence -- Data processing.</li> <li>▪ Prolog (Computer program language)</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Artificial intelligence	2	Semantic Web	2
Knowledge-based systems	2	Artificial intelligence	2

**Syllabus No. 71****Module Title****MANAGEMENT TECHNIQUES IN SOFTWARE****AIM:**

To develop a broad knowledge of issues, skills and techniques as a basis for performing an effective professional/management role in a software development environment.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Demonstrate and apply a comprehensive knowledge of the disciplines which support the mainstream software product development effort in order to assure that a product is delivered on time and within budget.
2. Apply the techniques of structured project management in the context of a phased software product development.
3. Utilise appropriate skills to analyse and resolve complex management issues in a software engineering management role.
4. Demonstrate an awareness of the current professional issues in the software industry.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0534954251	<b>NC</b>		
0130673382	658.15 <b>FP</b>	Financial management	▪ Engineering economy.
1403917094	302.2 <b>FP</b>	Communication	▪ Communication
0818680008	005.1/068/4 <b>TP</b>	Computer programming-- executive management	▪ Software engineering -- Management.
0138261733	005.1/068 <b>TP</b>	Computer programming-- management	▪ Computer software -- Development -- Management.
0201835959	005.1/068 <b>TP</b>	Computer programming-- management	▪ Software engineering.

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Computer programming— management (005.1/068)	2	Each SH appears once.	NA



**Syllabus No. 72****Module Title****MODELLING AND SIMULATION****AIM:**

To provide the ability to deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of analytical models and simulations, with particular emphasis on the behaviour of business and computer systems.

**LEARNING OUTCOMES:**

On successful completion of this subject the learner will:

1. Understand how to build models of complex systems.
2. Produce computer models of problem situations from a wide range of business and computer applications.
3. Realise the tradeoffs between different types of modelling techniques.
4. Appreciate the importance of good technique in pseudo-random number generation and be able to apply the standard techniques of pseudo-random number generation.
5. Comprehend the importance of good planning of simulation to achieve satisfactory return on expenditure.
6. Be able to implement, analyse and evaluate results from computer simulations

ISBN	Dewey No.	Dewey Caption	Subject Heading
0125980515	519.2 <b>TP</b>	Probabilities	<ul style="list-style-type: none"> <li>▪ Probabilities.</li> <li>▪ Computer science -- Mathematics.</li> </ul>
0470847727	003/.3 <b>TP</b>	Computer modelling and simulation	<ul style="list-style-type: none"> <li>▪ Computer simulation.</li> <li>▪ Simulation methods.</li> </ul>
0470092300	658.4/0352 <b>TP</b>	Simulation	<ul style="list-style-type: none"> <li>▪ Management science -- Computer simulation.</li> </ul>
0131429175	003/.3 <b>TP</b>	Computer modelling and simulation	<ul style="list-style-type: none"> <li>▪ Discrete-time systems -- Textbooks.</li> <li>▪ Computer simulation -- Textbooks.</li> <li>▪ Mathematical models -- Textbooks.</li> <li>▪ Random variables -- Textbooks.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Computer modeling and simulation (003.3)	2	Computer simulation	2

**Syllabus No. 73****Module Title****CRYPTOGRAPHY & NETWORK SECURITY****AIM:**

To provide the ability to critically analyse and evaluate various implementations of cryptographic algorithms and protocols and to show in-depth knowledge of securing a typical, commercial telecommunications system.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Analyse and evaluate various implementations of cryptographic algorithms and protocols.
2. Score the performance of commercial cryptographic algorithms.
3. Exhibit a detailed knowledge of system-level security issues.
4. Defend a system against intruders and viruses.
5. Judge the need for, and assess the different aspects of computer security.
6. Plan security policies and procedures and formulate some of the technical solutions.
7. Design security architectures across a range of platforms.
8. Assess the legal ethics of data protection and the impact of security policies on the Human Resources Department.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0471117099	005.8/2 <b>TP</b>	Data encryption	<ul style="list-style-type: none"> <li>▪ Computer security.</li> <li>▪ Telecommunication -- Security measures.</li> <li>▪ Cryptography.</li> </ul>
1578702569	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer networks -- Security measures.</li> <li>▪ Computer crimes -- Investigation.</li> </ul>
0130614661	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer security.</li> <li>▪ Computers -- Access control.</li> <li>▪ Electronic data processing departments -- Security measures.</li> </ul>
0471253111	005.8 <b>TP</b>	Data security	<ul style="list-style-type: none"> <li>▪ Computer security.</li> <li>▪ Computer networks -- Security measures.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Data security (005.8)	3	Computer security.	3
		Computer networks -- Security measures	2

**Syllabus No. 74****Module Title****COMPUTER GRAPHICS PROGRAMMING****AIM:**

To provide an understanding of fundamental and advanced graphical algorithms and their underlying theory. Learners will gain experience using a standard graphics API, and use this to create interactive displays using the theoretical knowledge.

**LEARNING OUTCOMES:**

On successful completion of this module the learner will be able to:

1. Explain the concepts and theories of computer graphics.
2. Analyse and evaluate a range of computer graphics techniques, identifying their limitations and strengths.
3. Identify and assess the trade-offs in the choice of computer graphics techniques for different applications.
4. Select appropriate computer graphics techniques in the development of software applications.
5. Apply selected techniques using industry-standard tools and languages.
6. Demonstrate an awareness of the applications and uses of computer graphics, and of industry trends in the field.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0321321375	006.6/6 TP	Programming ( child of 006.6 “computer graphics”)	<ul style="list-style-type: none"> <li>▪ Computer graphics.</li> <li>▪ OpenGL.</li> </ul>
013159690X	NC		
047143066	NC		
0321335732	006.6/6 TP	Programming ( child of 006.6 “computer graphics”)	<ul style="list-style-type: none"> <li>▪ Computer graphics.</li> <li>▪ OpenGL.</li> </ul>
0393730832	006.6/96 TP	Digital video	<ul style="list-style-type: none"> <li>▪ Computer Animation.</li> <li>▪ Three-dimensional display systems.</li> <li>▪ Computer graphics.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Programming ( child of 006.6 “computer graphics”) (006.6)	2	Computer graphics	3
		OpenGL	2

**Syllabus No. 75****Module Title****MULTIMEDIA****AIM:**

To provide the necessary skills to design, develop and test an interactive multimedia system that uses text, audio, graphics, animation and video.

**LEARNING OUTCOMES:**

The successful learner should be able to:

1. Plan and create storyboards
2. Create, edit and present text, audio, graphics, animation and video for use in multimedia systems
3. Compare, evaluate and select appropriate multimedia file formats for multimedia systems
4. Assess and evaluate user interface designs
5. Predict the general trends in emerging multimedia technologies

ISBN	Dewey No.	Dewey Caption	Subject Heading
0470858907	006.7 <b>TP</b>	Multimedia systems	▪ Multimedia systems
047085748X	006.7 <b>TP</b>	Multimedia systems	▪ Multimedia systems.
0716783215	006.7 <b>TP</b>	Multimedia systems	▪ Multimedia systems.

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Multimedia systems (006.7)	3	Multimedia systems.	3

**Syllabus No. 76****Module Title****ADVANCED DATABASES****AIM:**

To provide the ability to critically appraise the various database approaches to data management and an understanding of the major factors involved in the design and use of distributed database systems

**LEARNING OUTCOMES:**

On successful completion of this module the learner will:

1. Be able to critically appraise the various database approaches to data management
2. Appreciate the different approaches to concurrency control and database recovery
3. Understand the major factors involved in the design and use of distributed database systems
4. Be familiar with the advanced features of client/server database products such as SQL Server/Oracle

ISBN	Dewey No.	Dewey Caption	Subject Heading
0131238299	005.74 <b>TP</b>	Data files and databases	Object-oriented methods (Computer science) Database design.
0321122267	005.74 <b>TP</b>	Data files and databases	Database management.
0321210239	<b>NC</b>		

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
Data files and databases (005.74)	2	Each SH appears once.	NA

<b>Syllabus No. 77</b>	
<b>Module Title</b>	<b>Electrical Science 1</b>
<b>AIMS/OBJECTIVES</b>	
To give the student an understanding of the fundamental concepts of electricity and magnetism, using a simple introductory style and only simple mathematics.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0133099318	621.3 <b>TP</b>	Electrical, magnetic, optical, communications, computer engineering; electronics, lighting.	<ul style="list-style-type: none"> <li>▪ Electric engineering.</li> </ul>
020155707X	621.319/2 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> <li>▪ PSpice.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 78</b>	
<b>Module Title</b>	<b>Digital Systems 1</b>
<b>AIMS/OBJECTIVES</b>	
Introduces the student to combinatorial logic analysis, synthesis and design. The syllabus covers Boolean algebra, Karnaugh mapping, number systems and arithmetic, engineering aspects of TTL logic, and an introduction to latches and flip-flops.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0131946099	621.381 <b>TP</b>	Electronics	▪ Digital electronics.
0132132249	621.381 <b>TP</b>	Electronics	▪ Digital electronics.

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Electronics (621.381)	2	Digital electronics	2

<b>Syllabus No. 79</b>	
<b>Module Title</b>	<b>Engineering Maths 1</b>
<b>AIMS/OBJECTIVES</b>	
To develop the student's understanding and problem-solving skills in the areas of Pre-Calculus and Differential Calculus.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0471622117	515.15 <b>TP</b>	Calculus and analytic geometry	<ul style="list-style-type: none"> <li>▪ Calculus.</li> <li>▪ Geometry, Analytic.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA



<b>Syllabus No. 80</b>	
<b>Module Title</b>	<b>Physics For Engineers 1</b>
<b>AIMS/OBJECTIVES</b>	
To provide an appropriate foundation in physics, to suit students of Electronic and Computer Engineering.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0134329805	530 <b>TP</b>	Physics	Not available

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	NA	NA

<b>Syllabus No. 81</b>	
<b>Module Title</b>	<b>Micro-Economics</b>
<b>AIMS/OBJECTIVES</b>	
<p>To introduce students to the definition and nature of economics, distinguishing between micro and macroeconomics. To introduce and define concepts: an economic agent; demand and supply curves; a market; an industry. To develop some theoretical aspects: Price Theory; Theory of Consumer Choice; Theory of Production and Costs; Theory of the Firm and Industry in alternative market structures.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0321009339	338.5 TP	General production economics <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Microeconomics.</li> <li>▪ Microeconomics -- Examinations, questions, etc.</li> </ul>
0131994859	338.5 TP	General production economics	<ul style="list-style-type: none"> <li>▪ Microeconomics.</li> </ul>
0471979147	338.5 TP	General production economics	<ul style="list-style-type: none"> <li>▪ Microeconomics.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
General production economics (338.5)	3	Microeconomics	3

<sup>1</sup> Class here microeconomics (economics of the firm)

<b>Syllabus No. 82</b>	
<b>Module Title</b>	<b>Computer Software 2</b>
<p><b>AIMS/OBJECTIVES</b></p> <p>This module introduces the C programming language, so as to enable the student to solve a range of problems (e.g. generating Fibonacci numbers, matrix arithmetic, string manipulation, etc...). The nature and features of the C language, along with good program design using C, is also described.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0072121246	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> <li>▪ C++ (Computer program language)</li> </ul>
0314008160	005.13/3 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific programming languages (005.133)	2	C (Computer program language)	2

<b>Syllabus No. 83</b>	
<b>Module Title</b>	<b>Electrical Science 2</b>
<b>AIMS/OBJECTIVES</b>	
To develop a good understanding of ac circuit descriptions using vectors (and phasors) with numerous examples, using a simplified approach.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0133099318	621.3 <b>TP</b>	Electrical, magnetic, optical, communications, computer engineering; electronics, lighting	<ul style="list-style-type: none"> <li>▪ Electric engineering.</li> </ul>
020155707X	621.319/2 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> <li>▪ PSpice.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 84</b>	
<b>Module Title</b>	<b>Digital Systems 2</b>
<b>AIMS/OBJECTIVES</b>	
To build on the groundwork of Digital Systems 1, expanding student understanding of sequential systems. The module covers MSI combinatorial and sequential devices, simple state diagram concepts, programmable logic arrays and an introduction to simple text-based circuit modelling	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0131946099	621.381 <b>TP</b>	Electronics	<ul style="list-style-type: none"> <li>▪ Digital electronics.</li> <li>▪ Logic circuits.</li> </ul>
0132132249	621.381 <b>TP</b>	Electronics	<ul style="list-style-type: none"> <li>▪ Digital electronics.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Electronics (621.381)	2	Digital electronics.	2

<b>Syllabus No. 85</b>	
<b>Module Title</b>	<b>Engineering Maths 2</b>
<b>AIMS/OBJECTIVES</b>	
To develop the student's understanding, and problem solving skills, in the areas of Integral Calculus and Differential Equations. To give the student an understanding of Matrix Algebra and of its application to solving systems of linear equations. To introduce the student to Multivariate Calculus.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0471622117	515.15 <b>TP</b>	Calculus and analytic geometry	<ul style="list-style-type: none"> <li>▪ Calculus.</li> <li>▪ Geometry, Analytic.</li> </ul>
047150999X	519.4 <b>TP</b>	Applied numerical analysis	<ul style="list-style-type: none"> <li>▪ Numerical analysis.</li> </ul>
0471032476	512/.5 <b>TP</b>	Linear algebra	<ul style="list-style-type: none"> <li>▪ Algebras, Linear.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 86</b>	
<b>Module Title</b>	<b>Physics For Engineers</b>
<b>AIMS/OBJECTIVES</b>	
To provide a foundation in physics for students of Electronic and Computer Engineering.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0134329805	530 <b>TP</b>	Physics	NA
041258770	<b>NC</b>		
0442302495	537.622 <b>TP</b>	Semiconductivity <sup>1</sup>	▪ Semiconductors.

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<sup>1</sup> Class here solid-state physics of semiconductors

<b>Syllabus No. 87</b>	
<b>Module Title</b>	<b>Macro-Economics</b>
<b>AIMS/OBJECTIVES</b>	
<p>The purpose of this course is to introduce the student to the principles underlying the macro-economy. This is the study of how aggregate economic variables (such as the real growth rate, inflation and unemployment) behave and the type of policies that can be introduced to influence their behaviour.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0155188410	338.5 <b>FP</b>	General production economics	▪ Economics.
0132078295	339 <b>TP</b>	Macroeconomics and related topics	▪ Macroeconomics

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA



<b>Syllabus No. 88</b>	
<b>Module Title</b>	<b>Organisation Studies 2</b>

### AIMS/OBJECTIVES

This module is designed to give students an understanding of key concepts in Organisational Behaviour and enhance their ability to analyse their implications for management policy and practice.

ISBN	Dewey No.	Dewey Caption	Subject Heading
0717126684	658 <b>TP</b>	General management <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Organizational behavior -- Ireland.</li> </ul>
0761960465	658 <b>TP</b>	General management	<ul style="list-style-type: none"> <li>▪ Management.</li> <li>▪ Organization.</li> </ul>

Most frequent class(es)	Frequency	Most frequent subject Heading(s)	Frequency
<b>General management (658)</b>	2	Each SH appears once.	NA

<sup>1</sup> Class here general business management, general industrial management; management of public agencies that themselves provide direct services

<b>Syllabus No. 89</b>	
<b>Module Title</b>	<b>Computer Software 3</b>
<b>AIMS/OBJECTIVES</b>	
<p>To broaden the student's knowledge of the C programming language and its application to large program implementation. To introduce the student to a number of important algorithms used to search and sort data structures. To demonstrate the implementation of these algorithms in C, and show how this language can be used as a vehicle for the implementation of Abstract Data Types.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0070217483	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> </ul>
007881538X	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> <li>▪ C++ (Computer program language)</li> </ul>
0262032937	005.1 <b>TP</b>	Programming	<ul style="list-style-type: none"> <li>▪ Computer programming.</li> <li>▪ Computer algorithms.</li> </ul>
047112933X	005.133 <b>TP</b>	Specific programming languages	<ul style="list-style-type: none"> <li>▪ C (Computer program language)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific programming languages (005.133)	3	C (Computer program language)	3

<b>Syllabus No. 90</b>	
<b>Module Title</b>	<b>Circuit Analysis 1</b>
<b>AIMS/OBJECTIVES</b>	
<p>This module consolidates the work of EE4102 and makes the transition to a systems approach to the analysis of electronic circuits and systems. It covers passive RLC circuits, Bode diagrams, Laplace transforms, feedback concepts, and a detailed analysis of second order systems.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0675091683	621.3192 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> </ul>
0314795006	621.3192 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuit analysis.</li> </ul>
020155707X	621.3192 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> <li>▪ PSpice.</li> <li>▪ Electric circuit analysis -- Data processing.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Networks (Circuitry and lines) (621.3192)	3	Electric circuits	2
		Electric circuit analysis	2

<b>Syllabus No. 91</b>	
<b>Module Title</b>	<b>Active Circuit Design 1</b>
<b>AIMS/OBJECTIVES</b>	
Introduction to semiconductor device characteristics and basic amplifier stages	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0256261156	621.3815 <b>TP</b>	Components and circuits <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ Electronic circuit design.</li> <li>▪ Semiconductors -- Design and construction.</li> <li>▪ Electronic circuit design.</li> </ul>
0130959979	621.319/2 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> </ul>
013233982X	621.3815 <b>TP</b>	Components and circuits	<ul style="list-style-type: none"> <li>▪ PSpice.</li> <li>▪ Electric circuit analysis -- Data processing.</li> <li>▪ Electronics -- Charts, diagrams, etc.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Components and circuits (621.3815)	2	Each SH appears once.	NA

<sup>1</sup> Class here analog, digital, integrated, microelectronic, semiconductor, superconductor, thin-film circuits; circuits and components common to electronics and communications engineering

<b>Syllabus No. 92</b>	
<b>Module Title</b>	<b>Digital Systems 3</b>
<b>AIMS/OBJECTIVES</b>	
<p>This module, with Digital Systems 4, provides comprehensive coverage of both the software and hardware aspects of microprocessors and microprocessor-based design. The 8086 and IA-32 microprocessors are used as the model. Assembly language programming makes up an important part of the semester.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0130607142	004.165 <b>TP</b>	Specific microcomputers	<ul style="list-style-type: none"> <li>▪ Intel 80xxx series microprocessors.</li> <li>▪ Pentium (Microprocessor)</li> </ul>
0130491462	005.265 <b>TP</b>	Programming for specific computers	<ul style="list-style-type: none"> <li>▪ IBM Personal Computer Programming.</li> <li>▪ Assembler language (Computer program language)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 93</b>	
<b>Module Title</b>	<b>Engineering Maths 3</b>
<b>AIMS/OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>▪ To introduce the student to the Laplace Transform, Fourier Series, and their use in solving Ordinary Differential Equations.</li> <li>▪ To introduce the student to the theory and methods of Linear Algebra.</li> <li>▪ To give the student a broad understanding of the numerical processes used in solving Linear Algebra problems, and their extension to some nonlinear problems.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0471032476	512/.5 <b>TP</b>	Linear algebra	<ul style="list-style-type: none"> <li>▪ Algebras, Linear.</li> </ul>
047150999X	519.4 <b>TP</b>	Applied numerical analysis	<ul style="list-style-type: none"> <li>▪ Numerical analysis.</li> </ul>
0471848190	512/.5 <b>TP</b>	Linear algebra	<ul style="list-style-type: none"> <li>▪ Algebras, Linear.</li> </ul>
0521576083	519.4 <b>TP</b>	Applied numerical analysis	<ul style="list-style-type: none"> <li>▪ Numerical analysis -- Software.</li> <li>▪ Science -- Mathematics -- Software.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Linear algebra	2	Algebras, Linear.	2
Applied numerical analysis	2		

<b>Syllabus No. 94</b>	
<b>Module Title</b>	<b>Intermediate Economics</b>
<b>AIMS/OBJECTIVES</b>	
<p>The subject content of this module develops some of the analysis presented in the introductory microeconomics and macroeconomics modules. The macroeconomics section incorporates the labour market material into the general Keynesian, Classical model. The course also discusses issues in international monetary economics including the cost and benefits of EMU membership and the operation of the ECB</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0321112059	330 <b>TP</b>	Economics	Economics.
071713492X	<b>NC</b>		

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Each SH appears once.	NA

<b>Syllabus No. 95</b>	
<b>Module Title</b>	<b>Computer Software 4</b>
<b>AIMS/OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>▪ To introduce the C++ language as an alternative and better approach to expressing Abstract Data Types than C.</li> <li>▪ To acquaint the student with the fundamentals of computer graphics, using C++ as a medium to introduce the appropriate algorithms.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0078821231	005.13/3 <b>TP</b>	Specific programming languages	▪ C++ (Computer program language)
0201700735	005.13/3 <b>TP</b>	Specific programming languages	▪ C++ (Computer program language)
	006.6 <b>FN</b>	Computer graphics	

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific programming languages (005.133)	2	C++ (Computer program language)	2



<b>Syllabus No. 96</b>	
<b>Module Title</b>	<b>Circuit Analysis 2</b>
<b>AIMS/OBJECTIVES</b>	
This module introduces Fourier Analysis of repetitive signals, matrix techniques for circuit analysis and filter theory.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0675091683	621.3192 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> </ul>
0314795006	621.3192 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuit analysis.</li> </ul>
020155707X	621.319/2 <b>TP</b>	Networks (Circuitry and lines)	<ul style="list-style-type: none"> <li>▪ Electric circuits.</li> <li>▪ PSpice.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Networks (Circuitry and lines) (621.319/2)	3	Electric circuits.	2

<b>Syllabus No. 97</b>	
<b>Module Title</b>	<b>Active Circuit Design 2</b>
<b>AIMS/OBJECTIVES</b>	
This module introduces the basic properties of operational amplifiers and their use in both linear and non-linear applications. It also covers tuned amplifiers, class C working, and active filter designs.	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0256261156	621.3815 <b>TP</b>	Components and circuits	<ul style="list-style-type: none"> <li>▪ Electronic circuit design.</li> <li>▪ Semiconductors -- Design and construction.</li> </ul>
013233982X	621.3815 <b>TP</b>	Components and circuits	<ul style="list-style-type: none"> <li>▪ PSpice.</li> <li>▪ Electric circuit analysis -- Data processing.</li> <li>▪ Electronics -- Charts, diagrams, etc.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Components and circuits (621.3815 )	2	Each SH appears once.	NA

<b>Syllabus No. 98</b>	
<b>Module Title</b>	<b>Operating Systems 1</b>
<b>AIMS/OBJECTIVES</b>	
<p>To introduce a complete single-user, disk-based operating system. Students will already understand small systems at the logic level and at the programmer's model level. MS-DOS and Microsoft Windows will be the example operating systems. The module will include a project incorporating the use of an operating system.</p>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0130313580	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>
0201773449	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>
0131828274	005.4/3 <b>TP</b>	Systems programs Operating systems	<ul style="list-style-type: none"> <li>▪ Operating systems (Computers)</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Systems programs Operating systems (005.4/3)	3	Operating systems (Computers)	3

<b>Syllabus No. 99</b>	
<b>Module Title</b>	<b>Digital Systems 4</b>
<b>AIMS/OBJECTIVES</b>	
This semester covers the hardware of a microprocessor system, bus cycle timing, memory and I/O interfaces and interrupt architectures	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
0130607142	004.165 <b>TP</b>	Specific microcomputers	<ul style="list-style-type: none"> <li>▪ Intel 80xxx series microprocessors.</li> <li>▪ Pentium (Microprocessor)</li> </ul>
0314201882	004.165 <b>TP</b>	Specific microcomputers	<ul style="list-style-type: none"> <li>▪ INTEL 8051 (Computer)</li> <li>▪ Microcontrollers.</li> <li>▪ Digital control systems.</li> </ul>
0138546622	004.22 <b>TP</b>	Computer architecture	<ul style="list-style-type: none"> <li>▪ Computer programming.</li> <li>▪ Computer organization.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Specific microcomputers (004.165)	2	Each SH appears once.	NA

<b>Syllabus No. 100</b>	
<b>Module Title</b>	<b>Engineering Maths 4</b>
<b>AIMS/OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>▪ To introduce students to the broad meaning and many uses of statistics.</li> <li>▪ To provide students with an understanding of the fundamentals of probability.</li> <li>▪ To introduce the concept of a random variable.</li> <li>▪ To introduce statistical inference through the concepts of estimation and hypothesis testing.</li> </ul>	

<b>ISBN</b>	<b>Dewey No.</b>	<b>Dewey Caption</b>	<b>Subject Heading</b>
007053988X	519.5 TP	Statistical mathematics	<ul style="list-style-type: none"> <li>▪ Engineering -- Statistical methods.</li> <li>▪ Probabilities.</li> </ul>
0534209645	519.2 TP	Probabilities	<ul style="list-style-type: none"> <li>▪ Statistics.</li> <li>▪ Probabilities.</li> </ul>

<b>Most frequent class(es)</b>	<b>Frequency</b>	<b>Most frequent subject Heading(s)</b>	<b>Frequency</b>
Each class appears once.	NA	Probabilities	2