



J.B Institute of Engineering & Technology
Department of Information Technology

ACADEMIC PLANNING FOR
IV B.Tech I Semester
Academic Year (2010-11)

1. Multimedia & Application Development
2. Embedded Systems
3. Network Programming
4. Mobile Computing
5. Information Security
6. Software Project Management
7. Multimedia and Application Development Lab
8. Network Programming Lab

1. Multimedia & Application Development

JNTU Syllabus

Unit – I	Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.
Unit – II	Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MDI, quantization and transmission of audio.
Unit – III	Action Script I : ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.
Unit – IV	Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.
Unit – V	Application Development : An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.
Unit - VI	Multimedia data compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).
Unit - VII	Basic VIDEO compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.
Unit - VIII	Multimedia Networks : Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality

	of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).
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Guidelines to Students

Where will this subject help?

1. Web designing

Books / Material

Text Books :
1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI?Pearson Education.
2. Essentials ActionScript 2.0, Colin Moock, SPD O, REILLY.

Suggested / Reference Books
1. Digital multimedia, Nigel Chapman and Jenny Chapman, Wiley-DeeAmTech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson
3. Multimedia and communications technology, Steve Heath, Elsevier (Focal Press)
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer
5. Multimedia Basics by Wiexel Thomson
6. Multimedia Technology and Applications, David Himman, Galgotia

Number of Hours / lectures available in this Semester / Year	65
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Course Schedule

Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I	Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web , overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.	11
II	Fundamental concepts in video and audio: <i>Types of video signals, analog video, digital video, digitization of sound, MDI, quantization and transmission of audio.</i>	08
III	Action Script I : ActionScript Features, Object- Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.	8
IV	Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.	5
V	Application Development : An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.	09
VI	Multimedia data compression algorithm: Run- Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).	06

VII	Basic VIDEO compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.	08
VIII	Multimedia Networks : Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).	09
	Total	65

Topic wise Coverage:

**Unit I:
Fundamental concepts in Text and Image: LEARNING**

OBJECTIVES

LECTURE PLAN:

Total no_ of classes: 08

S.No	Name of the Topic	Reference book code	No. of classes required
1	Multimedia and hypermedia	1	2
2	world wide web	1,2	1
3	overview of multimedia software tools	1	1
4	Graphics and image data representation graphics/image data types	1	2
5	Graphics and image data representation graphics/image data types	1	1

6	Color in image and video: color science, color models in images	1	2
7	color models in video.	1	2

ASSIGNMENT-1

1.

UNIT-II :

LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes: 8

S.No	Name of the Topic	Reference book code	No. of classes required
8	Fundamental concepts in video and audio:	1	2
9	Types of video signals, analog video, digital video, digitization of sound	1	2
10	MDI	1	2
11	, quantization and transmission of audio.	1	2

ASSIGNMENT-II

UNIT-III

❖ LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes: 8

S.No	Name of the Topic	Reference book code	No. of classes required
12	Action Script I : ActionScript Features	1,2	2
13	Object-Oriented ActionScript	1,2	1
14	Datatypes and Type Checking	1,2	1
15	Classes	1,2	2
16	Authoring	1,2	1
17	an ActionScript Class	1,2	1

UNIT-IV :

❖ LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes: 5

S.No	Name of the Topic	Reference book code	No. of classes required
18	Action Script II : Inheritance	1,4	2
19	Authoring an ActionScript 2.0 Subclass	1,4	1
20	Interfaces,	1,4	1
21	Packages, Exceptions	1,4	1

UNIT-V:

❖ LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes: 9

S.No	Name of the Topic	Reference book code	No. of classes required
22	Application Development	4	2
23	An OOP Application Frame work	4	2
24	Using Components with ActionScript	4	2
25	MovieClip Subclasses	1,3	2
26	MovieClip Subclasses	1,3	1

UNIT-VI:

❖ LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes:

S.No	Name of the Topic	Reference book code	No. of Lecture classes required
27	Multimedia data compression algorithm: Run-Length Coding	1	2
28	Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization	1	2
29	Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).	1	2

UNIT-VII:

❖ LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes:

S.No	Name of the Topic	Reference book code	No. of classes required
30	Basic VIDEO compression Techniques	1,3	1
31	Introduction to video compression	1,3	2
32	video compression based on motion compensation	1,3	2
33	search for motion vectors,	1,3	2
34	MPEG	1	1
35	Basic Audio Compression Techniques	1	1

UNITVIII:

❖ LEARNING OBJECTIVES:**LECTURE PLAN:****Total No_ of Classes:**

S.No	Name of the Topic	Reference book code	No. of classes required
36	Multimedia Networks : Basics of Multimedia Networks: Transport of.	1,4,5	2
37	Multimedia Network Communications and Applications	1	2
38	Quality of Multimedia Data Transmission,	1	1
39	Multimedia over IP, Multimedia over ATM Networks,	1,3	2
40	MPEG-4, Media-on-Demand(MOD)	1,3	2



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7. Multimedia and Application Development Lab
8. Network Programming Lab

2. Embedded Systems

JNTU Syllabus

Unit No:	Topic:	Chapter no from TBooks & References:
Unit I	Embedded Computing: Introduction	Chapter 1 from T1,Wolf
	Complex Systems and Microprocessor	
	The Embedded System Design Process	
	Formalisms for System Design	
	Design Examples	
Unit II	The 8051 Architecture: Introduction	Chapter 3 from T2,Ayala
	8051 Micro Controller Hardware	
	Input/Output Ports and Circuits	
	External Memory	
	Counter and Timers	
	Serial data input/output	
	Interrupts	
Unit III	Basic Assembly Language Programming Concepts	Chapter 4,5&6 From T2,Ayala
	The Assembly Language Programming Process	
	Programming Tools and Techniques	
	Programming the 8051	
	Data Transfer and Logical Instructions)	
	Arithmetic Operations	Chapter 7&8
	Decimal Arithmetic	

Unit IV	Jump and Call Instructions	from T2, Ayala
	Further Details on Interrupts	
Unit V	Applications: Interfacing with Keyboards	Chapter 10&11 from T2, Ayala
	Displays, D/A and A/D Conversions	
	Multiple Interrupts	
	Serial Data Communications	
Unit VI	Introduction to Real-Time operating systems	Chapter 6 and 7 from R3 Simon
	Tasks and Task States	
	Tasks and Data	
	Semaphores and Shared Data	
	Message Queues	
	Mailboxes and Pipes	
	Timer Functions, Events	
	Memory Management	
Interrupt Routines in an RTOS Environment		
	Basic Design Using a Real Time Operating Systems	Chapter 8, 9, 10 and
	Principles, Semaphores and Queues	
	Hard Real Time Scheduling Considerations	
	Saving Memory and Power	
	An example RTOS like uC-OS (open Source)	
	Embedded Software Development Tools	
	Host and Target Machines	

Unit VII	Linker/Locators for Embedded	11 from R3, Simon
	Software, Getting Embedded Software into the Target System	
	Debugging Techniques	
	Testing on Host Machine	
	Using Laboratory Tools	
	An Example System	
Unit VIII	Introduction to advanced architectures	Chapter 8 from T1, Wolf
	ARM and SHARA	
	Processor and memory organization	
	Instruction level parallelism	
	Networked embedded systems	
	Bus protocols	
	I2C bus and CAN bus	
	Internet- Enabled system	
	Design Example	
	Elevator Controller	

Guidelines to Students

Where will this subject help?

Embedded systems are used all around you every day, and you may not notice them. Embedded computing is in many ways much more demanding than the sort of programs that you have written for PCs or workstations. This means that ES design is a useful skill for many types of product design. Automobiles, PDAs and even house hold appliances make use of microprocessors.

Books / Material

Text Books
T1: Computers and Components, Wayne Wolf, Elseveir.
T2: The 8051 Microcontroller, Third Edition, Kenneth J Ayala, Thomson.

Suggested / Reference Books
R1: Embedding System building blocks, Labrosse, via CMP publishers.
R2: Embedded Systems, Raj Kamal, TMH.
R3: An Embedded software primer,David E.Simon,Pearson Education

Course Schedule

Number of Hours / lectures available in this Semester / Year	65
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Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I	Embedded Computing: Introduction	05
	Complex Systems and Microprocessor	
	The Embedded System Design Process	
	Formalisms for System Design	
	Design Examples	
II	The 8051 Architecture: Introduction	07
	8051 Micro Controller Hardware	
	Input/Output Ports and Circuits	
	External Memory	
	Counter and Timers	
	Serial data input/output	
	Interrupts	
III	Basic Assembly Language Programming concepts:	05
	The Assembly Language Programming process	
	Programming Tools and Techniques	
	Programming the 8051	
	Data Transfer and Logical Instructions)	
IV	Arithmetic Operations	05
	Decimal Arithmetic	
	Jump and Call Instructions	

	Further Details on Interrupts	
V	Applications: Interfacing with Keyboards	10
	Displays	
	D/A conversion	
	A/D conversion	
	Multiple Interrupts	
	Serial Data Communications	
VI	Introduction to RTOS:	09
	Tasks and Task States	
	Tasks and Data	
	Semaphores and Shared Data	
	Message Queues	
	Mailboxes and Pipes	
	Timer Functions, Events	
	Memory management	
	Interrupt Routines in an RTOS Environment	
VII	Basic Design Using a RTOS:	13
	Principles, Semaphores and Queues	
	Hard Real Time Scheduling Considerations	
	Saving Memory and Power	
	An example RTOS like uC-OS (open Source)	
	Embedded Software Development Tools	
	Host and Target Machines	
	Linker/Locators for Embedded	
	Software, Getting Embedded Software into the Target	

	System	
	Debugging Techniques	
	Testing on Host Machine	
	Using Laboratory Tools	
	An Example System	
VIII	Introduction to advanced architectures :	11
	ARM and SHARA	
	Processor and memory organization	
	Instruction level parallelism	
	Networked embedded systems	
	Bus protocols	
	I2C bus and CAN bus	
	Internet- Enabled system	
	Design Example	
	Elevator Controller	
	Total	65

Topic wise Coverage:

Unit I : Embedded Computing:

LEARNING OBJECTIVES:

The objective of the Embedded Hardware Design course is to present to the student the computation devices, peripherals and networks along with software and hardware description language.(Verilog HDL), which are used in the design of a modern day embedded system. Since peripherals and networks are independent of the computing device used, the course would first only consider the Microcontroller as a computing device and build up the concept of peripherals and networks around it. Standard peripherals like Analog to Digital and Digital to Analog Converters (ADC and DAC), Universal Asynchronous

Receiver Transmitter (UART), Interrupt Controller, Programmable Peripheral Interface, Real Time Clock are discussed.

LECTURE PLAN: Total no_ of classes: 05

S.No	Name of the Topic	Text/Reference book code	No. of classes required
1	Embedded Computing: Introduction	T1	1
2	Complex Systems and Microprocessor	T1	1
3	The Embedded System Design Process	T1	1
4	Formalisms for System Design	T1	1
5	Design Examples	T1	1

UNIT-II : The 8051 Architecture:

LEARNING OBJECTIVES:

Describe the hardware features of the 8051 microcontroller.

List the internal registers of the 8051 microcontroller and their functions.

Draw the machine cycle for the 8051 microcontroller.

State the physical differences between the port 0, 1, 2 and 3.

LECTURE PLAN:Total No_ of Classes: 07

S.No	Name of the Topic	Reference book code	No. of classes required
06	The 8051 Architecture: Introduction	T2	1
07	8051 Micro Controller Hardware	T2	1
08	Input/Output Ports and Circuits	T2	1
09	External Memory	T2	1
10	Counter and Timers	T2	1
11	Serial data input/output	T2	1
12	Interrupts	T2	1

UNIT-III : Basic Assembly Language Programming concepts:**❖ LEARNING OBJECTIVES:**

Describe digital computer system organization and operations .

Explain the function of the cpu and memory.

Explain the difference between code and data memory.

Use flow chart elements.

Use commands that exchange data.

LECTURE PLAN: Total No_ of Classes: 05

S.No	Name of the Topic	Text/Reference book code	No. of classes required
13	Basic Assembly Language Programming concepts:	T2	1
14	The Assembly Language Programming process	T2	1
15	Programming Tools and Techniques	T2	1

16	Programming the 8051	T2	1
17	Data Transfer and Logical Instructions)	T2	1

UNIT-IV :

❖ **LEARNING OBJECTIVES:**

Data transfer instruction

Arithmetic instruction

Use instructions to increment and decrement the contents of registers and RAM.

Do signed and unsigned addition and subtraction.

Do unsigned multiplication and division.

Do BCD addition.

LECTURE PLAN: Total No_ of Classes: 05

S.No	Name of the Topic	Text/Reference book code	No. of classes required
18	Arithmetic Operations	T2	2
19	Decimal Arithmetic	T2	1
20	Jump and Call Instructions	T2	1
21	Further Details on Interrupts	T2	1

UNIT-V: Applications:

❖ **LEARNING OBJECTIVES:**

To interface keyboards to the 8031 based microcontrollers system.

Interface LED and LCD displays to the microcontroller system.

Use the microcontroller system to determine the frequency of external pulses.

Interface the microcontroller system to A/D and D/A converters.

Expand the interrupt capability of the microcontroller system.

Analyze a system configuration that includes a keyboard, an LCD display, and serial data transmission.

LECTURE PLAN: Total No_ of Classes: 10

S.No	Name of the Topic	Text/Reference book code	No. of classes required
22	Applications: Interfacing with Keyboards	T2	1
23	Displays	T2	1
24	D/A conversion	T2	2
25	A/D conversion	T2	2
26	Multiple Interrupts	T2	2
27	Serial Data Communications	T2	2

UNIT-VI: Introduction to RTOS:**LECTURE PLAN: Total No_ of Classes: 09**

S.No	Name of the Topic	Text/Reference book code	No. of Lecture classes required
28	Introduction to RTOS:	R3	1
29	Tasks and Task States	R3	1
30	Tasks and Data	R3	1
31	Semaphores and Shared Data	R3	1
32	Message Queues	R3	1
33	Mailboxes and Pipes	R3	1
34	Timer Functions, Events	R3	1
35	Memory management	R3	1
36	Interrupt Routines in an RTOS Environment	R3	1

UNIT-VII:**LECTURE PLAN: Basic Design Using a RTOS: Total No_ of Classes: 13**

S.No	Name of the Topic	Text/Reference book code	No. of classes required
37	Basic Design Using a RTOS:	R3	1
38	Principles, Semaphores and Queues	R3	1
39	Hard Real Time Scheduling Considerations	R3	1
40	Saving Memory and Power	R3	1
41	An example RTOS like uC-OS (open Source)	R3	1

42	Embedded Software Development Tools	R3	1
43	Host and Target Machines	R3	1
44	Linker/Locators for Embedded	R3	1
45	Software, Getting Embedded Software into the Target System	R3	1
46	Debugging Techniques	R3	1
47	Testing on Host Machine	R3	1
48	Using Laboratory Tools	R3	1
49	An Example System	R3	1

UNITVIII: Introduction to advanced architectures

LECTURE PLAN: Total No_ of Classes: 11

S.No	Name of the Topic	Text/Reference book code	No. of classes required
50	Introduction to advanced architectures :	T1	1
51	ARM and SHARA	T1	2
52	Processor and memory organization	T1	1
53	Instruction level parallelism	T1	1
54	Networked embedded systems	T1	1
55	Bus protocols	T1	1

56	I2C bus and CAN bus	T1	1
57	Internet- Enabled system	T1	1
58	Design Example	T1	1
59	Elevator Controller	T1	1



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7. Multimedia and Application Development Lab
8. Network Programming Lab

3. Network Programming

JNTU Syllabus

Unit – I	OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.
Unit – II	Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.
Unit – III	TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.
Unit – IV	I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.
Unit – V	Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.
Unit - VI	Elementary name and Address conversions: DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.
Unit - VII	IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores
Unit - VIII	Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

Guidelines to Students

Where will this subject help?

1. When we develop Client-Server Applications we use Socket Programming .

Books / Material

Text Books
UNIX Network Programming, Vol. I, Sockets API, 2 nd Edition. – W.Richard Stevens, Pearson

Suggested / Reference Books
1. UNIX Systems Programming using C++ T CHAN, PHI.
2. UNIX for Programmers and Users, 3 rd Edition Graham GLASS, King abls, Pearson Education

Course Schedule

Number of Hours / lectures available in this Semester / Year	65
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Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I	OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.	05
II	<i>.Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function</i>	08
III	Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.	8
IV	I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.	11
V	Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.	09
VI	DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.	09
VII	IPC : Introduction, File and record locking,	08

	Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores	
VIII	Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.	06
	Total	65

Topic wise Coverage:

Unit I: Introduction to Network Programming:

OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

LEARNING OBJECTIVES:

- ❖ Connection Establishment of client and server by using TCP protocol

LECTURE PLAN:

Total no_ of classes: 08

S.No	Name of the Topic	Reference book code	No. of classes required
1	Introduction ,OSI model,Unix standards	3	2
2	TCP and UDP connection establishment	1,3	2

3	Buffer sizes and limitation	3	1
4	TCP connection Format	3	1
5	UDP connection format	3	1
6	standard internet services	3	1
7	Protocol usage by common internet application	3	2

ASSIGNMENT-1

1. Explain about Layering Model ?
2. Explain about TCP & UDP connection Establishment ?
3. Explain about 3-Way Hand shaking for TCP connection ?

UNIT-II : Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

LEARNING OBJECTIVES: To learn Address structures and how to connect client and server by using sockets.

LECTURE PLAN:

Total No_ of Classes: 08

S.No	Name of the Topic	Reference book code	No. of classes required
8	Address structures, value – result arguments	4	2
9	Byte ordering and manipulation function and related functions	4	2
10	TCP sockets – Socket, connect, bind, listen, accept, fork and exec function,	4	2
11	concurrent servers. Close function and related function	4	2

ASSIGNMENT-II

1. Explain about Address Structures ?
2. Explain about Concurrent servers ?
3. Explain about TCP sockets Socket, connect, bind, listen, accept, fork and exec function ?

UNIT-III TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

❖ **LEARNING OBJECTIVES:**

1.To know How to start and terminate the connections when we developoe client server application.

2.crashing and rebooting of server host

LECTURE PLAN:

Total No_ of Classes: 08

S.No	Name of the Topic	Reference book code	No. of classes required
12	Introduction, TCP Echo server functions	1,3	2
13	Normal startup	1,3	1
14	terminate and signal handling server process termination	1,3	2
15	Crashing of server host	1,3	1
16	Rebooting of server host	1,3	1
17	Shut down of server host	1,3	1

UNIT-IV : I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

❖ **LEARNING OBJECTIVES:**

❖ To know the Structures of input/Output Models

LECTURE PLAN:

Total No_ of Classes: 11

S.No	Name of the Topic	Reference book code	No. of classes required
18	I/O Models	1,4	2
19	select function, Batch input	1,4	1
20	shutdown function, poll function	1,4	1
21	TCP Echo server	1,4	1
22	getsockopt and setsockopt functions	1,4	1
23	Socket states	1,4	2
24	Generic socket option IPV6	1,4	2
25	TCP socket options.	1,4	1

UNIT-V: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP

❖ **LEARNING OBJECTIVES:**

To know UDP connection format and lost of datagrams when we send the packets to server

LECTURE PLAN:

Total No_ of Classes: 09

S.No	Name of the Topic	Reference book code	No. of classes required
26	Introduction UDP Echo server function	4	2
27	lost datagram, summary of UDP example	4	2
28	, Lack of flow control with UDP	4	2
29	determining outgoing interface with UDP	1,3	2
30	determining outgoing interface with TCP	1,3	1

UNIT-VI: DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information

❖ LEARNING OBJECTIVES:

To know what is DNS and how it works and to know the networking information

LECTURE PLAN:

Total No_ of Classes: 09

S.No	Name of the Topic	Reference book code	No. of Lecture classes required
31	DNS	1	2
32	gethost by Name function	1	1
33	Resolver option	1	2

34	Function and IPV6 support	1	2
35	uname function, other networking information	1	2

UNIT-VII:

❖ LEARNING OBJECTIVES:

To learn how to exchange information between two processes

By using Pipes , fifos etc.

LECTURE PLAN:

Total No_ of Classes: 09

S.No	Name of the Topic	Reference book code	No. of classes required
36	Introduction, File and record locking	1,3	1
37	Pipes,FIFOs	1,3	2
38	streams and messages	1,3	2
39	Name spaces, system IPC,	1,3	2
40	Message queues,	1	1
41	Semaphores	1	1

UNIT VIII: Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

❖ **LEARNING OBJECTIVES:**

To learn about Remote Procedure calls and how they work .

LECTURE PLAN:

Total No_ of Classes: 06

S.No	Name of the Topic	Reference book code	No. of classes required
42	Remote Login,Terminal line disciplines	1,4,5	2
43	Pseudo-Terminals	1	2
44	Terminal modes	1	1
45	Control Terminals, rlogin Overview	1,3	2
46	RPC Transparency Issues	1,3	2



J.B Institute of Engineering & Technology
Department of Information Technology

ACADEMIC PLANNING FOR
IV B.Tech I Semester
Academic Year (2010-11)

1. Multimedia & Application Development
2. Embedded Systems
3. Network Programming
4. Mobile Computing
5. Information Security
6. Software Project Management
7. Multimedia and Application Development Lab
8. Network Programming Lab

4. Mobile Computing

JNTU Syllabus

Unit – I	Introduction to Mobile Communications and Computing : Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture. GSM : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.
Unit – II	(Wireless) Medium Access Control : Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.
Unit – III	Mobile Network Layer : Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).
Unit – IV	Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.
Unit – V	Database Issues : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.
Unit - VI	Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

Unit - VII	Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.
Unit - VIII	Protocols and Tools : Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

Guidelines to Students

Where will this subject help?

After completing this subject , students will be able to

- explain the principles of mobile computing technologies;
- list different applications that mobile computing offers to people, employees, and businesses;
- describe the possible future of mobile computing technologies and applications.

Books / Material

Text Books
<ol style="list-style-type: none"> 1. Jochen Schiller,“Mobile Communications”,Addison-Wesley. (Chapters 4,7,9,10,11),second edition, 2004. 2. Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

Suggested / Reference Books
<p>1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,</p> <p>2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.</p> <p>3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.</p> <p>4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.</p>

Course Schedule

Number of Hours / lectures available in this Semester / Year	65
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Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I	Introduction to Mobile Communications and Computing	8
II	Medium Access Control	6
III	Mobile Network Layer	6
IV	Mobile Transport Layer	6
V	Database Issues	6

VI	Data Dissemination	8
VII	Mobile Adhoc Networks	8
VIII	Protocols and Tools	10
	Total	60

Topic wise Coverage:

Subject Plan

Academic year: 2011-2012

Lecture No.	Unit No	Topic	Chapter nos. from Text Books and References
1.	1	Introduction to MC, Novel applications	Hand out –1
2.	1	limitations, and architecture.	
3.	1	GSM : Mobile services	
4.	1	System architecture	
5.	1	Radio interface, Protocols	
6.	1	Localization and calling, Handover,	
7.	1	Security and New data services.	
8	1	Assignment	
9	2	(Wireless) Medium Access Control : Motivation for a specialized MAC	Hand out –2
10.	2	SDMA	
11.	2	FDMA,	
12.	2	TDMA,	

13.	2	CDMA.	
14	2	Assignment	
15.	3	Mobile Network Layer : Mobile IP, Goals	Hand out –3
16.	3	assumptions, entities and terminology, IP packet delivery,	
17.	3	agent advertisement and discovery, registration, tunneling and encapsulation, optimizations	
18.	3	Dynamic Host Configuration Protocol (DHCP).	
19.	3	Dynamic Host Configuration Protocol (DHCP).	
20	3	Assignment	
21.	4	Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP	Hand out –4
22.	4	Mobile TCP, Fast retransmit/fast recovery	
23.	4	Transmission /time-out freezing	
24.	4	Selective retransmission, Transaction oriented TCP.	
25.	4	Selective retransmission, Transaction oriented TCP.	
26	4	Assignment	
27.	5	Database Issues : Hoarding techniques	Hand out –5
28.	5	caching invalidation mechanisms	
29.	5	client server computing with adaptation	
30.	5	power-aware and context-aware computing	
31.	5	transactional models	
32.	5	query processing	

33.	5	recovery, and quality of service issues.	
34	5	Assignment	
35.	6	Data Dissemination: Communications asymmetry,	Hand out –6
36.	6	classification of new data delivery mechanisms,	
37.	6	push-based mechanisms	
38.	6	pull-based mechanisms	
39.	6	hybrid mechanisms	
40.	6	selective tuning (indexing) techniques.	
41.	6	selective tuning (indexing) techniques.	
42.	6	Assignment	
43.	7	Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET	Hand out –7
44.	7	spectrum of MANET applications,	
45.	7	spectrum of MANET applications,	
46	7	routing and various routing algorithms,	
47.	7	routing and various routing algorithms	
48.	7	security in MANETs.	
49.	7	security in MANETs	
50.	7	Assignment	
51.	8	Protocols and Tools : Wireless Application Protocol-WAP. Introduction,	Hand out –8
52.	8	protocol architecture,	
53.	8	treatment of protocols of all layers	

54.	8	Bluetooth (User scenarios	
55.	8	physical layer,	
56.	8	MAC layer,	
57	8	Networking security,	
58.	8	link management	
59.	8	J2ME.	
60	8	Assignment	

Assignment Questions

1. a) Explain the applications and limitations of mobile computing.
(b) Explain GSM system architecture
2. Compare the following four medium access systems.
(i) SDMA (ii) TDMA (iii) FDMA (iv) CDMA
3. (a) Explain the entities of mobile IP.
(b) Describe Data transfer from a mobile node to a fixed node and vice versa.
4. (a) Write detailed notes on Fast retransmit/fast recovery of Mobile transport layer.
(b) Explain Transmission/ Time-out freezing approach.
5. (a) Explain power-aware computing.
(b) Explain the following cache invalidation mechanisms.
(i) State less Asynchronous (ii) Stateful synchronous
6. Explain data delivery methods in detail.
7. (a) Explain in detail, properties of MANET.
(b) Describe security problems in MANETs.
8. (a) Explain the architecture of WAP.
(b) Explain briefly about the wireless Datagram protocol (WDP) of transport layer



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5. Information Security

JNTU Syllabus

Unit – I	Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.
Unit – II	Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC
Unit – III	Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.
Unit – IV	Email privacy: Pretty Good Privacy (PGP) and S/MIP
Unit – V	IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management

Unit - VI	Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).
Unit - VII	Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats.
Unit - VIII	Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

Guidelines to Students

Where will this subject help?

After completing this subject , students will be able to

- Explain the Conventional Encryption Principles;
- Explain the Public key cryptography principles

Text Books

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permech, wiley Dreamtec

Suggested / Reference Books
1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press) 2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI. 3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson 4. Principles of Information Security, Whitman, Thomson. 5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH 6. Introduction to Cryptography, Buchmann, Springer. For more details, visit http://www.jntu.ac.in/

Course Schedule

Number of Hours / lectures available in this Semester / Year	65
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Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I	Introduction to Information security, attacks, services	8
II	<i>Conventional Encryption Principles,</i>	6
III	Public key cryptography principles	6
IV	Email privacy	6
V	IP Security Overview	6

VI	Web Security Requirements	8
VII	Basic concepts of SNMP	8
VIII	Firewall Design principles	10
	Total	60

Topic wise Coverage:

Subject Plan

Academic year: 2011-2012

Lecture No.	Unit No	Topic	Chapter nos. from Text Books and References
1.	1	Security Attacks (Interruption, Interception, Modification and Fabrication),	Hand out –1
2.	1	Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability	
3.	1	Mechanisms, A model for Internetwork security,	
4.	1	Internet Standards and RFCs	
5.	1	Buffer overflow & format string vulnerabilities	
6.	1	TCP session hijacking	
7.	1	TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.	

8	1	Assignment	
9	2	Conventional Encryption Principles	Hand out –2
10.	2	Conventional encryption algorithms	
11.	2	cipher block modes of operation, location of encryption devices	
12.	2	key distribution Approaches of Message Authentication	
13.	2	Secure Hash Functions and HMAC	
14	2	Assignment	
15.	3	Public key cryptography principles,	Hand out –3
16.	3	public key cryptography algorithms	
17.	3	digital signatures, digital Certificates	
18.	3	key management Kerberos	
19.	3	X.509 Directory Authentication Service.	
20	3	Assignment	
21.	4	Email privacy	Hand out –4
22.	4	Pretty Good Privacy (PGP	
23.	4	Pretty Good Privacy (PGP	
24.	4	S/MIME	
25.	4	S/MIME	
26	4	Assignment	
27.	5	IP Security Overview	Hand out –5
28.	5	IP Security Architecture,	

29.	5	Encapsulating Security Payload	
30.	5	Combining Security Associations	
31.	5	Authentication Header	
32.	5	Key Management.	
33.	5	Encapsulating Security Payload	
34	5	Assignment	
35.	6	Web Security Requirements	Hand out –6
36.	6	Secure Socket Layer (SSL	
37.	6	Transport Layer Security (TLS	
38.	6	Secure Electronic	
39.	6	secure Electronic Transaction (SET).	
40.	6	ecure Electronic Transaction (SET).	
41.	6	ecure Electronic Transaction (SET).	
42.	6	Assignment	
43.	7	Basic concepts of SNMP	Hand out –7
44.	7	SNMPv1 Community facility	
45.	7	SNMPv1 Community facility	
46	7	Transport Layer Security (TLS	
47.	7	Secure Electronic Transaction (SET).	
48.	7	Secure Electronic Transaction (SET).	
49.	7	Secure Electronic Transaction (SET).	
50.	7	Assignment	
51.	8	Firewall Design principles	Hand out –8

52.	8	Firewall Design principles	
53.	8	Firewall Design principles	
54.	8	Firewall Design principles	
55.	8	Trusted Systems	
56.	8	Trusted Systems	
57	8	Intrusion Detection Systems.	
58.	8	Intrusion Detection Systems.	
59.	8	Intrusion Detection Systems.	
60	8	Assignment	

Assignment Questions

1. a) Explain the Security Attacks (Interruption, Interception, Modification and Fabrication),
(b) Explain Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability SM system architecture
2. Explain Conventional Encryption Principles
3. (a) Explain public key cryptography algorithms
(b) Describe cipher block modes of operation, location of encryption devices
4. (a) Write detailed notes on Email privacy
(b) Explain S/MIME
5. (a) Explain IP Security Architecture,
(b) Explain Encapsulating Security Payload
6. Explain Web Security Requirements.
7. (a) Explain in detail, SNMPv1 Community facility
(b) Describe Secure Electronic Transaction (SET).
8. (a) Explain the Firewall Design principles
(b) Explain briefly about the Intrusion Detection Systems.



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6. Software Project Management

JNTU Syllabus

Unit – I

Conventional Software Management: The waterfall model, conventional software management performance.

Evolution Software Economics: Software Economics, pragmatic software cost estimation.

Unit – II

Improving Software Economics: Reducing software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality. Peer inspections.

The Old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Unit – III

Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, Pragmatic artifacts.

Unit – IV

Model based software architectures: A Management perspective and Technical perspective.

Work flows of the process: Software process workflows, Iteration workflows.

Unit – V

Checkpoints of the process: Major milestones, Minor milestones, Periodic status assessments.

Iterative Process Planning: Work Breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

Unit – VI

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of organizations.

Process Automation: Automation Building Blocks, The Project Environment,

Unit – VII

Project Control and Process Instrumentation: The seven core Metrics, Management Indicators, Quality Indicators, Life cycle expectations, pragmatic software metrics, Metrics Automation.

Tailoring the process: Process discriminants.

Unit – VIII

Future Software Project Management: Modern Project Profiles, Next generation software economics, modern process transitions.

Case Study: The Command Center Processing and Display system- Replacement(CCPDS-R)

Guidelines to Students

Where will this subject help?

1. SPM helps to develop the small business **project management software** can **help** you organize your business, collaborate effectively and plan and track project comprehensively. The **subject** aims to promote **software project management** and **software** quality assurance with respect to the phases of the **software** cycle, project **support**

Books / Material

Text Books

T1. Software Project Management, Walker Royce: Pearson Education, 2005.

Suggested / Reference Books

R1 Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.

R2 Software Project Management, Joel Henry, Pearson Education.

R3 Software Project Management in practice, Pankaj Jalote, Pearson Education, 2005

Course Schedule

Number of Hours / lectures available in this Semester / Year	65
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Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
I		08
II		11
III		8
IV		6
V		08
VI		06
VII		09
VIII		08
	Total	65

Topic wise Coverage:

Unit I:

Conventional Software Management: The waterfall model, conventional software management performance.

Evolution Software Economics: Software Economics, pragmatic software cost estimation.

LEARNING OBJECTIVES:

- To develop the systematic approach required for software development

LECTURE PLAN:

Total no_ of classes: 08

S.No	Name of the Topic	Text/Reference book code	No. of classes required
1	The waterfall model,	T1	1
2	conventional software management performance	T1	2
3	Software Economics	T1	2
4	pragmatic software cost estimation	T1	3

ASSIGNMENT-1

1.

UNIT-II :

Improving Software Economics: Reducing software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality. Peer inspections.

The Old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

LEARNING OBJECTIVES:

LECTURE PLAN:

Total No_ of Classes: 11

S.No	Name of the Topic	Text/Reference book code	No. of classes required
5	Reducing software product size	T1	1
6	improving software processes	T1	1
7	improving team effectiveness	T1	1
8	improving automation	T1	1
9	Achieving required quality, Peer inspections	T1	1
10	The principles of conventional software Engineering	T1	2
11	principles of modern software management	T1	2
12	transitioning to an iterative process	T1	2

ASSIGNMENT-II

UNIT-III

Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, Pragmatic artifacts.

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 08

S.No	Name of the Topic	Text/Reference book code	No. of classes required
12	Engineering and production stages	T1	1
13	Inception, Elaboration,	T1	2
14	Construction, Transition phases	T1	2
15	The artifact sets	T1	1
16	Management artifacts, Engineering artifacts	T1	1
17	Pragmatic artifacts.	T1	1

UNIT-IV :

Model based software architectures: A Management perspective and Technical perspective.

Work flows of the process: Software process workflows, Iteration workflows.

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 06

S.No	Name of the Topic	Text/Reference book code	No. of classes required
18	A Management perspective	T1	1
19	Technical perspective	T1	1
20	Software process workflows	T1	2
21	Iteration workflows.	T1	2

UNIT-V:

Checkpoints of the process: Major milestones, Minor milestones, Periodic status assessments.

Iterative Process Planning: Work Breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 08

S.No	Name of the Topic	Text/Reference book code	No. of classes required
22	Major milestones	T1	1
23	Minor milestones, Periodic status assessments	T1	2
24	Work Breakdown structures	T1	1
25	planning guidelines, cost and schedule estimating,	T1	2
26	Iteration planning process, Pragmatic planning	T1	2

UNIT-VI:

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of organizations.

Process Automation: Automation Building Blocks, The Project Environment,

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 06

S.No	Name of the Topic	Text/Reference book code	No. of Lecture classes required
27	Line-of-Business Organizations	T1	1
28	Project Organizations	T1	2
29	evolution of organizations	T1	1
30	Automation Building Blocks	T1	1
31	The Project Environment	T1	1

UNIT-VII:

Project Control and Process Instrumentation: The seven core Metrics, Management Indicators, Quality Indicators, Life cycle expectations, pragmatic software metrics, Metrics Automation.

Tailoring the process: Process discriminants.

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 09

S.No	Name of the Topic	Text/Reference book code	No. of classes required
30	The seven core Metrics	T1	1
31	Management Indicators, Quality Indicators	T1	2
32	Life cycle expectations	T1	2
33	pragmatic software metrics	T1	2
34	Metrics Automation	T1	1
35	Process discriminants	T1	1

UNITVIII:

Future Software Project Management: Modern Project Profiles, Next generation software economics, modern process transitions.

Case Study: The Command Center Processing and Display system- Replacement(CCPDS-R)

- **LEARNING OBJECTIVES:**

LECTURE PLAN:

Total No_ of Classes: 08

S.No	Name of the Topic	Reference book code	No. of classes required
36	Modern Project Profiles	T1	2
37	Next generation software economics,	T1	2
38	modern process transitions	T1	2
39	Case Study: The Command Center Processing and Display system- Replacement(CCPDS-R)	R1	2