

1. COURSES OFFERED

S.No.	COURSES	DURATION	Medium of Instruction
1.	POST GRADUATE DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT Optional Subjects Option (A) - Networking Stream Option (B) - Unix Stream	One Year	English
2.	POST GRADUATE DIPLOMA IN ENTERPRISE COMPUTING Optional Subjects Option (A) - IBM Mainframe Application Software Option (B) - IBM Mainframe Systems Management Option (C) - IBM Mainframe Database Administration	One Year	English

Admissions will be made in two streams namely
(i) Academic Year Admissions (June to May)
and
(ii) Calendar Year Admissions (January to December)

**LAST DATE FOR RECEIPT OF FILLED-IN
APPLICATION FORM**

30.03.2009

2. CORRESPONDENCE AND ENQUIRY

A) CORRESPONDENCE – COURSES / ADMISSIONS

The Director

Institute of Distance Education
University of Madras
IDE Buildings, Chepauk
Chennai-600 005.

Telephone No. : 044-25613716
Telegram : OPENLEARN
Fax : 91-44-25360865
E-mail : ide123@vsnl.net, directoride@unom.ac.in
Website : www.unom.ac.in

B) CORRESPONDENCE – EXAMINATIONS / CERTIFICATES

The Controller of Examinations

University of Madras
University Centenary Building
Chepauk, Chennai-600 005.

Telephone No. : 044-25368496
Fax : 91-44-25366368
E-mail : contexam@md2.vsnl.net

The Additional Controller of Examinations

Institute of Distance Education
University of Madras
Auditorium Building
Chepauk, Chennai-600 005.

Telephone No. : 044-25392231 / 25613704
Fax : 91-44-25393595

C) CALL CENTRE CONTACT NUMBERS : 044 - 25393453 / 044 - 25393454

D) ENQUIRY & GRIEVANCE REDRESS

Contact Numbers

: 044 - 25613727 / 044 - 25613728
: 044 - 25613729 / 044 - 25613730
: 044 - 25613731

E) MAPLES ESM TECHNOLOGIES

284/1A, Old Mahabalipuram Road
Kandanchavadi, Perungudi Post
Chennai-600 096.

Telephone No. : 044 - 4220 4545 (Board)
044 - 4220 4520 (Direct)
044 - 4220 4530 (Direct)
Fax : 044 - 4220 4546
E-mail : training@maplesesm.com
Website : www.maplesedu.net

IMPORTANT TELEPHONE NUMBERS

(A) Institute of Distance Education

Sl. No.	Officers' Designation	Phone Numbers	Fax Numbers
01	DIRECTOR	044-25362716 / 25613701	91-44-25360865
02	CONTROLLER OF EXAMINATIONS	044-25368496 / 25399405	91-44-25366368
03	ADDITIONAL CONTROLLER OF EXAMINATIONS [IDE]	044-25392231 / 25613704	91-44-25393595
04	DEPUTY REGISTRAR [FINANCE & ADMINISTRATION]	044-25384746 / 25613702	91-44-25393368
05	DEPUTY REGISTRAR [ADMISSIONS]	044-25393457 / 25613722	91-44-25393457
06	ACCOUNTS OFFICER	044-25382572 / 25613703	
07	PUBLIC RELATIONS OFFICER	044-25385539 / 25613713	91-44-25385539
08	ASSISTANT REGISTRAR [GENERAL]	044-25613705	
09	ASSISTANT REGISTRAR [FINANCE]	044-25613706	
10	ASSISTANT REGISTRAR [UG. ADMISSIONS]	044-25613707	
11	ASSISTANT REGISTRAR [PG. ADMISSIONS]	044-25613708	
12	ASSISTANT REGISTRAR [LESSONS]	044-25613709	
13	ASSISTANT REGISTRAR [SC/ST Cell]	044-25613793	
14	ASSISTANT REGISTRAR [IDE. CERTIFICATE]	044-25613778	
15	ASSISTANT REGISTRAR [IDE.PG/PROF. EXAMINATIONS]	044-25613714	
16	ASSISTANT REGISTRAR [IDE. UG. EXAMINATIONS-I]	044-25613737	
17	ASSISTANT REGISTRAR [IDE. UG. EXAMINATIONS-II]	044-25613736	
18	ASSISTANT PUBLIC RELATIONS OFFICER [IDE. EXAMINATIONS]	044-25613718	
19	PG. ADMISSION-VI SECTION DIPLOMA IN AIRHOSTESS AND AVIATION HOSPITALITY	044-25613762	
20	IDE EXAMINATION E-VI SECTION	044-25613712	
21	IDE CERTIFICATE SECTION	044-25613779	

(B) Maples ESM Technologies

Sl. No.	Officers' Designation	Phone Numbers	Mobile Numbers	Fax Numbers
01	ASSOCIATE VICE PRESIDENT (MF PRACTICES)	044-42204537	9940087215	
02	ASSOCIATE VICE PRESIDENT (TRAINING)	044-42204522	9940087213	91-44-24964563
03	DELIVERY HEAD (TRAINING)	044-42204560	9840967213	
04	PROGRAM CO-ORDINATOR	044-42204550	9940086229	

3. NOTE TO APPLICANTS

1. Before filling in the application read the **Prospectus** carefully. Preserve the **Prospectus** till the completion of the course.
2. The Applicant has to **detach and fill in the following** :
(1) **Application Form** (2) **Computer Coding Sheet** (3) **Address Slip**.
3. The Application must be accompanied by **All the Original Certificates** as stated in the Prospectus and the **Registration Fee** paid through Bank Challan System (or) Demand Draft drawn in favour of **The Director, Institute of Distance Education, University of Madras, Payable at Chennai**.
Registration Fee : P.G. Diploma Course **Rs.120/-**
4. The Applicant has to state clearly the Course and the Optional Subject which he/she wants to study.
5. **Photographs to be affixed** :
 1. One on the Application Form
[Attested by a Gazetted Officer/Faculty/Officials of the University with Seal].
 2. One on the Address Slip.
 3. One on the reverse side of Coding Sheet.

The Institute of Distance Education (IDE) will remain closed on Sundays and Holidays declared by the Government of Tamil Nadu.

Maples ESM Technologies will function all days including Saturdays and Sundays except holidays declared by the Government of Tamil Nadu.

IMPORTANT NOTE FOR PAYMENT OF FEES

*Students are advised to avail themselves of the facility offered by the **Banks** designated by the Institute of Distance Education University of Madras, spread all over **INDIA** for payment of fees relating to remittance of Registration fee, Tuition fee, Examination fee and other fees as applicable without any additional charges. A challan in triplicate is appended to the **Prospectus** for the purpose of remittance of fees. The challan is also available in all branches of the above **designated BANKS**. In places where there is no **designated BANKS**, the students may make the payment by means of **DEMAND DRAFT** obtained from any Nationalised / Scheduled Bank drawn in favour of **“THE DIRECTOR, IDE, UNIVERSITY OF MADRAS”** payable at Chennai.*

ATTENTION

Students can also obtain Prospectus at Maples ESM Technologies Centres listed in the Prospectus (Refer Page No.21)

4. REGULATIONS POST GRADUATE DIPLOMA COURSES

(Non-Semester)

(w.e.f. Calendar Year 2009 / Academic Year 2009-2010)

(i) P.G. DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT

Option (A) - Networking Stream

Option (B) - Unix Stream

(ii) P.G. DIPLOMA IN ENTERPRISE COMPUTING

Option (A) - IBM Mainframe Application Software

Option (B) - IBM Mainframe Systems Management

Option (C) - IBM Mainframe Database Administration

(A) ELIGIBILITY CONDITION FOR ADMISSION

A candidate who has passed any Undergraduate Degree Examination of this University or an examination of other University accepted by the Syndicate of this University as equivalent thereto shall be eligible for admission to this PG. Diploma Program.

(B) ELIGIBILITY FOR THE AWARD OF DIPLOMA

A candidate shall be eligible for the award of the Diploma only if he/she has satisfactorily undergone the prescribed course of study in this University for a period of not less than One Calendar Year/ Academic Year.

(C) DURATION OF THE COURSE

The duration of the course will be One Year under Non-Semester Pattern.

(D) ATTENDANCE

No candidate shall be admitted to the examination unless he/she has attended **not less than 75%** of the classes held.

(E) MEDIUM OF INSTRUCTION

The courses will be offered in **English Medium** only.

(F) PROGRAM OF STUDY

The program of study for the Diploma shall consist of a minimum of Twelve Courses / Papers covering both Theory and Viva-Voce.

(i) P.G. DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT

Core Subject contains Three Theory Papers and two Computer Laboratories. The Optional Subject offered in Two Different Streams listed below contain Three Theory Papers and Three Computer Laboratories and one Project.

Two Different streams are offered namely,

Option (A) - Networking Stream

Option (B) - Unix Stream

(ii) P.G. DIPLOMA IN ENTERPRISE COMPUTING

Core Subject contains Three Theory Papers and Two Computer Laboratories. The Optional Subject offered in Three different Streams listed below contain Three Theory Papers, Three Computer Laboratories and One Project.

Option (A) - IBM Mainframe Application Software

Option (B) - IBM Mainframe Systems Management

Option (C) - IBM Mainframe Database Administration

5. COURSES OF STUDY & SCHEME OF EXAMINATION

(i) P.G. DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT

OPTION (A) - NETWORKING STREAM

S.No.	Details	Maximum Marks			Min. Pass Marks	Duration in Hours
		Internal	External	Total		
	CORE SUBJECTS					
1	Paper-I - Enterprise Networking Technologies	40	60	100	50	3
2	Paper-II - Service and Security Management of Information Technology	40	60	100	50	3
3	Paper-III - Enterprise Systems Management Tools	40	60	100	50	3
	PRACTICALS					
4	Computer Laboratory - I Service and Security Management of Information Technology	20	30	50	25	3
5	Computer Laboratory - II Enterprise System Management Tools	20	30	50	25	3
	OPTIONAL SUBJECTS					
6	Paper-IV - Network Routing	40	60	100	50	3
7	Paper-V - Network Switching	40	60	100	50	3
8	Paper-VI - Wide Area Network Security	40	60	100	50	3
	PRACTICALS					
9	Network Computer Laboratory - III Network Routing	20	30	50	25	3
10	Network Computer Laboratory - IV Network Switching	20	30	50	25	3
11	Network Computer Laboratory - V Wide Area Network Security	20	30	50	25	3
12	PROJECT Case Study Project Report Viva-Voce	50	60 40	150	75	3

P.G. DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT

OPTION (B) - UNIX STREAM

S.No.	Details	Maximum Marks			Min. Pass Marks	Duration in Hours
		Internal	External	Total		
	CORE SUBJECTS					
1	Paper-I - Enterprise Networking Technologies	40	60	100	50	3
2	Paper-II - Service and Security Management of Information Technology	40	60	100	50	3
3	Paper-III - Enterprise Systems Management	40	60	100	50	3
	PRACTICALS					
4	Computer Laboratory - I Service and Security Management of Information Technology	20	30	50	25	3
5	Computer Laboratory - II Enterprise Systems Management Tools	20	30	50	25	3
	OPTIONAL SUBJECTS					
6	Paper-IV - IBM Advanced AIX Administration	40	60	100	50	3
7	Paper-V - SUN Solaris Administration	40	60	100	50	3
8	Paper-VI - Data Storage Management	40	60	100	50	3
	PRACTICALS					
9	Unix Computer Laboratory - III IBM Advanced AIX Administration	20	30	50	25	3
10	Unix Computer Laboratory - IV SUN Solaris Administration	20	30	50	25	3
11	Unix Computer Laboratory - V Data Storage Management	20	30	50	25	3
12	PROJECT Case Study Project Report Viva-Voce	50	60 40	150	75	3

(ii) P.G. DIPLOMA IN ENTERPRISE COMPUTING

OPTION (A) - IBM MAINFRAME APPLICATION SOFTWARE

S.No.	Details	Maximum Marks			Min. Pass Marks	Duration in Hours
		Internal	External	Total		
	CORE SUBJECTS					
1	Paper-I - Enterprise Mainframe Technologies	40	60	100	50	3
2	Paper-II - Fundamentals of Mainframe Operating Systems	40	60	100	50	3
3	Paper-III - Mainframe Data Organization	40	60	100	50	3
	PRACTICALS					
4	Computer Laboratory - I Fundamentals of Mainframe Operating Systems	20	30	50	25	3
5	Computer Laboratory - II Mainframe Data Organization	20	30	50	25	3
	OPTIONAL SUBJECTS					
6	Paper-IV - Mainframe COBOL Programming	40	60	100	50	3
7	Paper-V - Mainframe Database (DB2) Management	40	60	100	50	3
8	Paper-VI - On-line Transaction Processing	40	60	100	50	3
	PRACTICALS					
9	Computer Laboratory - III Mainframe COBOL Programming	20	30	50	25	3
10	Computer Laboratory - IV Mainframe Database (DB2) Management	20	30	50	25	3
11	Computer Laboratory - V On-line Transaction Processing	20	30	50	25	3
12	PROJECT Case Study Project Report Viva-Voce	50	60 40	150	75	3

P.G. DIPLOMA IN ENTERPRISE COMPUTING

OPTION (B) - IBM MAINFRAME SYSTEM MANAGEMENT

S.No.	Details	Maximum Marks			Min. Pass Marks	Duration in Hours
		Internal	External	Total		
	CORE SUBJECTS					
1	Paper-I - Enterprise Mainframe Technologies	40	60	100	50	3
2	Paper-II - Fundamentals of Mainframe Operating Systems	40	60	100	50	3
3	Paper-III- Mainframe Data Organization	40	60	100	50	3
	PRACTICALS					
4	Computer Laboratory - I Fundamentals of Mainframe Operating Systems	20	30	50	25	3
5	Computer Laboratory - II Mainframe Data Organization	20	30	50	25	3
	SUBJECTS					
6	Paper-IV- Principles of Mainframe Operation	40	60	100	50	3
7	Paper-V - Mainframe Security Management	40	60	100	50	3
8	Paper-VI- Mainframe Networking	40	60	100	50	3
	PRACTICALS					
9	Computer Laboratory - III Principles of Mainframe Operation	20	30	50	25	3
10	Computer Laboratory - IV Mainframe Security Management (RACF)	20	30	50	25	3
11	Computer Laboratory - V Mainframe Networking	20	30	50	25	3
12	PROJECT Case Study Project Report Viva-Voce	50	60 40	150	75	3

P.G. DIPLOMA IN ENTERPRISE COMPUTING

OPTION (C) - IBM MAINFRAME DATABASE ADMINISTRATION

S.No.	Details	Maximum Marks			Min. Pass Marks	Duration in Hours
		Internal	External	Total		
	CORE SUBJECTS					
1	Paper-I - Enterprise Mainframe Technologies	40	60	100	50	3
2	Paper-II - Fundamentals of Mainframe Operating System	40	60	100	50	3
3	Paper-III - Mainframe Data Organization	40	60	100	50	3
	PRACTICALS					
4	Computer Laboratory - I Fundamentals of Mainframe Operating Systems	20	30	50	25	3
5	Computer Laboratory - II Mainframe Data Organization	20	30	50	25	3
	OPTIONAL SUBJECTS					
6	Paper-IV - Mainframe Database Design	40	60	100	50	3
7	Paper-V - Mainframe Database for System Support	40	60	100	50	3
8	Paper-VI - Mainframe Database Administration	40	60	100	50	3
	PRACTICALS					
9	Computer Laboratory - III Mainframe Database Design	20	30	50	25	3
10	Computer Laboratory - IV Mainframe Database for System Support	20	30	50	25	3
11	Computer Laboratory - V Mainframe Database Administration	20	30	50	25	3
12	PROJECT Case Study Project Report Viva-Voce	50	60 40	150	75	3

PROJECT

Students enrolled in **P.G. Diploma Course in Remote Infrastructure Management** (Option (A) – Networking Stream; and Option (B) Unix Stream) shall be required to prepare project report on the basis of case study carried out by him/her in a business or industrial organization, on possible solutions for a typical problem of current interest in the area of Remote Infrastructure Management (RIM) relating to Networking Stream/Unix Stream subject concerned. The report should demonstrate the capability of the student for some creative potential and original approach to solve the practical problems in today's business or industry. The report of case study should be presented in a comprehensive manner with recommendation for solutions based on scientifically worked out data.

Similarly, students enrolled in **P.G. Diploma Course in Enterprise Computing** (Option (A) – IBM Mainframe Application Software; Option (B) – IBM Mainframe Systems Management; and Option (C) – IBM Mainframe Database Administration) shall be required to prepare project report on the basis of case study carried out by him/her in a business or industrial organization, on possible solutions for a typical problem of current interest in the area of Enterprise Computing relating to IBM Mainframe Application Software, IBM Mainframe Systems Management, and IBM Mainframe Database Administration subject concerned. The report should demonstrate the capability of the student for some creative potential and original approach to solve the practical problems in today's business or industry. The report of case study should be presented in a comprehensive manner with recommendation for solutions based on scientifically worked out data.

The Project Report based on Case Study must be submitted before the stipulated time, failing which the candidate will be treated as appearing on a second occasion and shall **NOT BE ELIGIBLE** for **FIRST CLASS** and **RANKING**.

EVALUATION

The performance of candidates in each paper is evaluated by a combination of internal assessment and University Examination. The maximum mark for the internal assessment is 40 and for the University Examination 60, for each paper. The marks for the internal assessment for each theory paper shall be carried out by conducting the internal test and assignment or evaluation, by the course faculty who is handling the paper.

The performance of candidates in the University Examinations of the Practical Papers will be evaluated by two external examiners appointed by the University. The maximum mark for the internal assessment is 20 and for the University Examination 30, for each paper. The marks for the internal assessment for each theory paper shall be carried out by conducting the internal test and assignment or evaluation, by the course faculty who is handling the practical paper.

PASSING MINIMUM

- (i) A candidate shall be declared to have passed in each paper/practical/project wherever prescribed, if he/she secures **50%** of the marks in both Internal & External relating to theory/practicals/project prescribed for the examination. He/she shall be declared to have passed the whole examination, if he/she passes in all the papers wherever prescribed as per the scheme of examination.
- (ii) Candidates who do not obtain the required minimum marks of pass in a paper(s) shall be required to appear for a pass in the same at a subsequent appearance.

CLASSIFICATION OF SUCCESSFUL CANDIDATES

- (i) Candidates who secure not less than **60%** of aggregate marks in the whole examinations shall be declared to have passed the examination in **FIRST CLASS**.
- (ii) All other successful candidates shall be declared to have passed in the examination in **SECOND CLASS**.
- (iii) Candidates who obtain not less than **75%** of the marks in the aggregate shall be deemed to have passed the examination in the **FIRST CLASS** with **DISTINCTION** provided they pass all the examinations prescribed for the courses in the **FIRST APPEARANCE**.

RANKING

Candidates who pass all the examinations prescribed for the course in **FIRST APPEARANCE ALONE** are eligible for **RANKING/DISTINCTION**.

PATTERN OF QUESTION PAPER

Part-A

Answer All Questions (10 X 1 = 10 Marks)

Part-B

Answer any 5 out of 8 questions (5X 4 = 20 Marks)

Not exceeding 200 words

Part-C

Answer any 3 out of 5 questions (3 X 10 = 30 Marks)

Not exceeding 500 words

6. FEE DETAILS

(A) BREAK-UP OF FEE

Sl. No.	NAME OF THE FEE	Amount Rs.
1.	Registration Fee along with the filled in Application	120
2.	Admission fee	50
3.	Matriculation Fee for those who are seeking admission to the University of Madras for the first time	30
4.	Recognition fee a) Examination of other Boards/ Universities in India b) Examination of other Boards/ Universities outside India	300 2,020
5.	Postage & Stationery Fees	500
6.	Development Fee	100
7.	Course Fee i) Remote Infrastructure Management Option (A) - Networking Stream Option (B) - Unix Stream	 25,000 25,000
	ii) Enterprise Computing Option (A) - IBM Mainframe Application Software Option (B) - IBM Mainframe System Management Option (C) - IBM Mainframe Database Administration	 30,000 30,000 35,000

Note : Sl. No. 2 to 6 are related to Process Fee.

(B) TOTAL FEE PARTICULARS

S.No.	Courses	Course Code	University of Madras			Universities in India recognized by UGC			Universities in Abroad recognized by UGC		
			Process Fee Rs.	Course Fee Rs.	Total Fee Rs.	Process Fee Rs.	Course Fee Rs.	Total Fee Rs.	Process Fee Rs.	Course Fee Rs.	Total Fee Rs.
1.	P.G. Diploma in Remote Infrastructure Management	DNS	770	25,000	25,770	1,100	25,000	26,100	2,820	25,000	27,820
			770	25,000	25,770	1,100	25,000	26,100	2,820	25,000	27,820
2.	P.G. Diploma in Enterprise Computing	Option (A) IBM Mainframe Application Software	770	30,000	30,770	1,100	30,000	31,100	2,820	30,000	32,820
			770	30,000	30,770	1,100	30,000	31,100	2,820	30,000	32,820
		Option (B) IBM Mainframe System Management	770	30,000	30,770	1,100	30,000	31,100	2,820	30,000	32,820
			770	30,000	30,770	1,100	30,000	31,100	2,820	30,000	32,820
		Option (C) IBM Mainframe Database Administration	770	35,000	35,770	1,100	35,000	36,100	2,820	35,000	37,820
			770	35,000	35,770	1,100	35,000	36,100	2,820	35,000	37,820

7. GENERAL INFORMATION

- 1) Candidates who have passed the Three Year Undergraduate Degree Courses through the Universities recognised by the University Grants Commission [UGC] with 15 years duration either under 10 + 2 + 3 [or] 11 + 1 + 3 [or] 11 + 2 + 2 [or] 11 Years S.S.L.C. plus One Year P.U.C. [or] 10 Years S.S.L.C. plus 2 Years Pre-Degree/P.U.C./Intermediate/Degree Course under 10 + 2 + 3 pattern [or] Degree Course Passed under Open University System through the Universities recognized by the U.G.C. / Post Graduate, Professional Degree Courses under Regular Stream of the recognized Universities are eligible for admission to Post Graduate Diploma Courses offered by this Institute.
- 2) Candidates should furnish all the particulars required in the Application Form / Coding Sheet / Address Slip in **Capital Letters** and to affix his/her Signature with Date wherever necessary. Otherwise, application is liable for rejection.
- 3) **CERTIFICATES TO BE ENCLOSED WITH APPLICATION**
 - i) **Transfer Certificate / Course Completion Certificate** from the Head of the Institution where the applicant last studied.
 - ii) **Statement of Marks** in Original for the qualifying **examination** viz. **10th, 12th** and **Degree Course** for verification and to consider for admission to P.G. Diploma Courses in (i) Remote Infrastructure Management, and (ii) Enterprise Computing.
 - iii) Provisional Pass / Degree Certificate of Examination Passed by him/her for verification and to consider for admission to P.G. Diploma Course in (i) Remote Infrastructure Management / (ii) Enterprise Computing.
 - iv) If the certificates are in a language other than English/Tamil, an authenticated **translation in English** should be sent along with the originals duly attested by a Gazetted Officer.
 - v) All the original certificates should be attached at the left hand top corner of the application form with a tag or string to prevent them from getting lost.
 - vi) **Candidates are advised to take sufficient number of xerox copies of their original certificates before sending them to the Institute.**
- 4) **GUIDELINES**
 - i) Candidates pursuing any other Under Graduate Degree Course of study either in this Institute or elsewhere **are not eligible** for admission to the P.G. Diploma Courses in (i) Remote Infrastructure Management / (ii) Enterprise Computing.

- ii) Admission to candidates who have qualified from other Universities/Bodies will be considered only on the condition that their previous qualifications are recognised by this University. However, action will be taken to recognise the examination of a recognised University. This is subject to approval by the authorities of the University of Madras.
- iii) Admission to candidates who have qualified from the Universities other than the recognised Universities in India will be considered only on the condition that they should submit their application form along with ‘**EQUIVALENT CERTIFICATE**’ obtained either from the **University Grants Commission (UGC) / Association of Indian Universities (AIU)**, New Delhi, India or from the **Indian Embassy of the Country Concerned**, stating that his/her previous degree awarded by the University of the Country where he/she had undergone the course is “**EQUIVALENT TO THE DEGREE COURSE OFFERED IN THE RECOGNISED UNIVERSITIES IN INDIA**” pertaining to duration of course and academic aspects. This is subject to the approval of the authorities of the University of Madras. Otherwise, the application submitted by him/her will not be considered for admission.
- iv) The filled in application form duly signed by the candidate together with all original certificates mentioned above and a fee paid Challan endorsed by designated Bank for **Rs.120/-** towards registration fee should be sent by Registered-Post with Acknowledgement Due or submitted or presented in person to “*The Director, Institute of Distance Education, University of Madras, Chepauk, Chennai - 600 005.* The Registration fee once paid will not be refunded under any circumstances. Failure to submit any of the above Certificates / Documents may entail rejection of his / her application.
 - (a) A **Course Completion Certificate** will be issued by the **Institute of Distance Education, University of Madras** on completion of the course, if candidate has no arrears of fee. Candidates who have completed the course are permitted to take the examinations in which they have not passed even after the issue of the Course Completion Certificate, till the regulation under which the candidate has undergone the course is in force.
 - (b) A **Technical Merit Certificate** will be issued by **Maples ESM Technologies** after successful completion of the course.

IMPORTANT NOTE

- 1) Visually and other Physically challenged candidates are advised not to apply for the courses which involve practicals and handling of instruments and equipments.
- 2) **Legal dispute, if any, relating to Admission / Examinations of IDE., will be subject to Chennai Jurisdiction only.**

METHOD OF PAYMENT OF FEES

- 1) No extension of time will be given under any circumstance for payment of fees. Fees may be paid by means of challan through the **designated Banks** spread all over India. In places where there is no designated Bank branches, students may make the payment by means of **DEMAND DRAFT** (Nationalised / Scheduled Bank) drawn in favour of “**The Director, IDE., University of Madras**”, payable at Chennai. *Postal Orders, Money Orders, Mail Transfers and Cash Payments will not be accepted.*

- 2) Candidates are advised to send or present the fee paid challan endorsed by the designated bank to the Institute or to Maples ESM Technologies as soon as they get it from the bank, so as to enable the Institute to send learning and other materials quickly or facilitate the collection of the learning materials from Maples ESM Technologies.
- 3) *Fees once remitted will not be refunded or adjusted in any manner under any circumstances.*

METHOD OF INSTRUCTION

- 1) The method of instruction comprises (a) distributing learning materials and (b) personal contact program. The learning materials can be collected by the students or his/her representative personally from the Institute/ P.C.P. Centres of Maples ESM Technologies on production of the fee paid challan endorsed by the designated **BANK** for the course fees.
- 2) The Personal Contact Program classes will be arranged for the benefit of students in selected centres of Maples ESM Technologies. The number of P.C.P. Centres will depend on student enrolment. This program is meant for class room lectures on important topics and clearing the doubts of the students. Students are advised to attend the classes in their own interest for effective learning. The venue and dates of these programs will be intimated individually.
- 3) Prescribed text books are not supplied to the candidates by the Institute of Distance Education. Hence, they are advised to get them from the book-sellers. However, learning materials will be sent to the candidates.
- 4) Learning materials will be supplied at the Personal Contact Program Centres of **Maples ESM Technologies**. Those who are not able to receive at PCP Centres of Maples ESM Technologies may request **“The Director, IDE, University of Madras”** along with the fee paid details to despatch the learning materials by post.

ADDRESS SLIP

Applicants are required to furnish their address in each of the six slots provided for the purpose on a separate sheet attached to the application form. The admission intimation, original certificates and learning materials will be sent to the address furnished in the Address Slip only. Write the address in block (Capital) letters and use ball pen only.

CHANGE OF ADDRESS

All communications and learning materials, in the case of those who opt to receive by post, will be sent to the candidates to the address given in the application form. Any change in the address should be intimated to the **Institute of Distance Education, University of Madras / Maples ESM Technologies** PCP Centres concerned immediately with the enrolment number. Candidates are advised to make necessary arrangements in the post office for their mail to be redirected to their new address, in the event of a despatch being sent before the change of address is effected.

IDENTITY CARD

The Identity Card will be issued after the course fee is paid. The Identity Card will be valid till the completion of the course. In the event of a student discontinuing the course, the card shall become invalid for the year yet to be completed. Candidates are instructed to preserve their Identity Cards. They should note that the examination Hall Ticket will be issued by the Chief superintendent of the Examination Centre, only on production of the Identity Card. Arrear candidates can use the Identity Card for obtaining Hall Tickets even after the duration of the course of study is over. If the original Identity Card is lost, **a duplicate card will be issued on payment of Rs.100/-** through the designated Bank. The payment endorsed by designated Bank challan together with a passport size photograph should be sent for obtaining '**Duplicate Identity Card**'.

ENROLMENT NUMBER

An Enrolment Number will be assigned to the candidate on admission. This enrolment number will hold good for the entire duration of the course of study. In every communication addressed to the Institute, this number should be quoted. Letters received without the enrolment number will not be considered.

The Enrolment Number is a twelve digit unique code (alpha-numeric). The first two digits indicate the **year of admission**. The third, fourth and fifth the **centre**. The sixth, seventh and eighth the **subject**, and last four the actual **enrolment number**.

SPOT ADMISSION

- 1) Spot Admission will be given to those who come to the Institute in person with the required original Certificates / Documents.
- 2) Eligible candidates who seek spot admission can collect their learning materials at the **Institute of Distance Education, University of Madras / Maples ESM Technologies** Centres itself, by producing the IDE copy of the designated **BANK** fee paid challan towards course fee and other fees prescribed for the course concerned. For particulars of total fees to be paid (excluding Registration Fee), please see the respective Tables (Refer Page No.14).

EXAMINATION

Generally, examination shall be conducted during the month of May / June, for the academic year stream and during the month of December / January, for the calendar year stream.

CANDIDATES WITH ARREARS

Students with arrears, after the completion of the duration of the course of study, have to seek and obtain on their own initiative, with a requisition letter and with self-addressed envelope, the particulars of change of syllabus, provision for completion of course, Practical Classes, Practical Examinations, Examination Application Forms from '**The Director, IDE., University of Madras**'. In all the communications to the Institute, these candidates should quote the Enrolment Number and address.

PROVISIONAL CERTIFICATE AND DIPLOMA

Provisional Certificate will be issued to those who have qualified for the P.G Diploma Course after the publication of results. **For obtaining Provisional Certificate and Diploma, a Fee of Rs.300/- or such fees as may be in force from time to time, should be paid along with the Examination Fee.**

Prescribed forms for obtaining Provisional Certificate and Diploma Certificate are also available with the Institute of Distance Education, University of Madras / Maples ESM Technologies Centres. They can also be downloaded from the Website (www.unom.ac.in)

8. PERSONAL CONTACT PROGRAM

Students are instructed to note the following

1. Students are advised to make their own arrangement for Boarding and Lodging.
2. Students are advised to bring their own Note-books, Pens, Pencils, etc.
3. Students from other than Chennai District and other States may attend Classes at any one of the nearest Personal Contact Program (PCP) Centres of Maples ESM Technologies.
4. Detailed Time-Table for PCP Classes will be made available at the PCP Centres of Maples ESM Technologies on the first day of the PCP Classes.
5. Any change in the program will be intimated to the students at the venue of the PCP Classes.
6. PCP Classes will be held from 9.00 a.m. to 12.45 p.m. & 1.30 p.m. to 5.15 p.m. Any change in time will be intimated to the students.
7. Students should not use Cell Phones in the class rooms.
8. Students of Chennai District are advised to collect their study materials from the Institute of Distance Education, University of Madras and other Districts / States can collect the study materials from the PCP Centres of the Maples ESM Technologies of the Districts / States concerned, by submitting their course fee remittance challan endorsed by the designated Bank.
9. Students are instructed to keep their Identity Card ready to be produced for any reference.

PERSONAL CONTACT PROGRAM CENTRES

- [i] Personal Contact Programs will be organized in Chennai and other Districts in Tamil Nadu and also other States by Maples ESM Technologies. The PCP Centres of Maples ESM Technologies are listed in the statement below.
- [ii] Personal Contact Programs for Theory and Practical shall be conducted at the PCP Centres of Maples ESM Technologies listed in the statement below subject to sufficient enrolment of students. Otherwise, these students shall be merged with other nearby PCP Centres.
- [iii] The PCP Centre Code allotted to the places of centres in the statement below be chosen by the candidates and the same be indicated in the boxes provided in the application form as well as coding sheet properly.
- [iv] The Personal Contact Programs shall be conducted on all week days / week end (Saturday & Sunday) except on holidays declared by the Government, for the convenience of the students at the PCP Centres of Maples ESM Technologies listed in the statement below.

SL. NO.	PCP CENTRES	CENTRE CODE
1.	CHENNAI-KANDANCHAVADI	251
2	CHENNAI -ANNA NAGAR	252
3	CHENNAI -NANDANAM	253
4.	COIMBATORE	254
5.	TRICHY	255
6.	HYDERABAD	256
7.	BANGALORE	257
8.	PUNE	258

The detailed schedule for Personal Contact Program regarding Dates, Venue, etc., will be intimated separately.

PERSONAL CONTACT PROGRAM

Sl. No.	COURSE	HOURS TO BE CONDUCTED	ATTENDANCE	CENTRES
1	P.G. Diploma Course in Remote Infrastructure Management Option (A) Networking Stream	200 Hours	Compulsory	Chennai and other centres of the Maples ESM Technologies
	Option (B) Unix Stream	200 Hours	Compulsory	Chennai and other centres of the Maples ESM Technologies
2	P.G. Diploma Course in Enterprise Computing Option (A) IBM Mainframe Application Software	200 Hours	Compulsory	Chennai and other centres of the Maples ESM Technologies
	Option (B) IBM Mainframe System Management	200 Hours	Compulsory	Chennai and other centres of the Maples ESM Technologies
	Option (C) IBM Mainframe Database Administration	200 Hours	Compulsory	Chennai and other centres of the Maples ESM Technologies

- Note :**
- ◆ Theory Classes and Practical Examinations will be held at Maples ESM Technologies, Centres at Chennai and Other Districts in Tamilnadu and States.
 - ◆ Classes will be conducted for all the courses depending upon student enrolment.
 - ◆ If the strength is not sufficient in any centre, it will be merged with the centre nearest to it.

9. IDE and MAPLES ESM TECHNOLOGIES ADMISSION CENTRES

Centre Code	Name and Address of the Admission Centres	Contact Numbers
101	Institute of Distance Education University of Madras, IDE Building, Chepauk, Chennai-600 005.	Tel : 044-25613716, 044-25613755, 044-25613762 Fax : 91-44-25360865 E-mail : ide123@vsnl.net
251	Maples ESM Technologies No. 284/1A, Old Mahabalipuram Road, Kandanchavadi, Perungudi PO, (Opp. to Prince Info City), Chennai-600 096.	Tel : 044-42204545 (Board), 044-42204520, 044-42204530 (Direct) Mobile : 9940086236 Fax : 044-42204546 E-mail : chennai.corp@maplesesm.co.in
252	Maples ESM Technologies Ameex Education, No. 101, W-Block, 2nd Avenue, 2nd Floor, (Near Indian Bank & Roundana Bus Stop) Anna Nagar, Chennai-600 040.	Tel : 044-42615320 Mobile : 9444426109 E-mail : chanai.angr@maplesesm.co.in
253	Maples ESM Technologies Dallas Dated Systems No. 130, 3rd Main Road, CIT Nagar, Nandanam, (Near YMCA) Chennai-600 035.	Tel : 044-42070450, 044-42070460 Mobile : 9940086231 E-mail : chennai.nandanam@maplesesm.co.in
254	Maples ESM Technologies No. 438-A, Kamarajar Salai, Singanallur Main Road (Opp. to More Super Market - Near Hope College) Peelamedu, Coimbatore-641 004.	Tel : 0422-2599450, 0422-2599451 Mobile : 9940683724 E-mail : cbe@maplesesm.co.in
255	Maples ESM Technologies Centre for University-Industry Collaboration (CUIC) Anna University - Tiruchirappalli, Trichirappalli-620 024.	Tel : 0431-2407949 E-mail : try@maplesem.co.in
256	Maples ESM Technologies Flat No. 3-6-363 & 3-6-1/1, Mahavir House, 5th Floor, (Above STANZA Showroom), Himayathnagar Road, Basheerbagh, Hyderabad-500 029.	Tel : 040-66772248, 040-66772249 E-mail : hybd@maplesesm.co.in
257	Maples ESM Technologies No. 33, IIInd Floor, 17th Main, 5th Block, Koramangala, Bangalore-560 095.	Tel : 080-32908413, 080-32934769 E-mail : blore@maplesesm.co.in
258	Maples ESM Technologies 401, IndiaCo I Centre, Suriya Plaza, No. 214, 3rd Floor, Navipeth, Near Dandeka Bridge, LBS Road, Pune-411 030.	Tel : 020-24327388, 020-24327389 Mobile : 9766117374, 9850214365 E-mail : pune@maplesesm.co.in

10. GRIEVANCE FORM
(MAKE PHOTOCOPIES FOR USE)

UNIVERSITY OF MADRAS
INSTITUTE OF DISTANCE EDUCATION
CHEPAUK, CHENNAI-600 005

Date.....

Name of the Course :	Year of Admission
Name of the Candidate :	Enrolment No. :
Address :	* Month and Year of passing the Examination } Month
	* Payment Particulars
Pin-code :	* These details should be furnished relating to Provisional/Diploma Certificate.

Grievance in brief

Signature of the Student

(To be filled in by the Office)

Action taken

ASST./A.S.O.

SECTION OFFICER

P.R.O.

The filled-in grievance form may be sent to 'The Public Relations Officer, Institute of Distance Education, University of Madras, Chepauk, Chennai - 600 005'. Fax No. : 91-44-25385539

11. SYLLABI

1. POST-GRADUATE DIPLOMA IN REMOTE INFRASTRUCTURE MANAGEMENT

CORE COURSES

(COMMON TO OPTION (A) NETWORKING STREAM, AND OPTION (B) UNIX STREAM)

PAPER I - ENTERPRISE NETWORKING TECHNOLOGIES

Prerequisite : Admission

UNIT-I : Fundamentals of Enterprise Computing

What is Enterprise Computing – Enterprise network layers - Enterprise wide technologies – Enterprise Hardware – Servers, Clients, Workstations – Core Layer – Distribution Layer – Access Layer.

UNIT-II : Basics of Networking

Networking topologies – Bus Topology – Star Topology – Ring topology – Mesh Topology – Hybrid Topology – Internetworking – Connectivity devices – Hub – Switch – Router – Gateway.

UNIT-III : Storage

Different types of storage concepts – Backup – Restore – Redundancy – Hot swapping – RAID Concepts – High Availability – Scalability – Security.

UNIT-IV : Enterprise WAN Technologies

How to connect enterprise networking – WAN Technologies – Security – High availability – DSL – ISDN – VPN.

UNIT-V : Principles of TCP/IP

Introduction to TCP/IP – IP Address – Class A, B, C, D, E – Subnetting – Subnet Mask – Gateway Address – Network Operating Systems (NOS) – Server NOS & Client NOS.

Text Book :

- Hern Z-Gerd, Integrated Management of Network Systems – Morgan Koufmann Press, 1999.

References :

- Douglas E. Comer, Computer Networks and Internet, Prentice Hall, 2008.

Web Services: www.cisco.com

PAPER II - SERVICE AND SECURITY MANAGEMENT OF INFORMATION TECHNOLOGY

Prerequisite : Enterprise Networking Technologies

UNIT-I : Basics of Information Technology Infrastructure Library (ITIL)

ITIL Concepts – Why ITIL – Benefits of ITIL – OGC.

UNIT-II : ITIL Service Support

Service Desk – Incident Management – Definition – Process – Metrics – Roles – Tools – Problem Management – Change Management – Configuration Management – Release Management – Definition – Process – Metrics – Roles – Tools.

UNIT-III : ITIL Service Delivery

SLA Management – Availability Management – Capacity Management – IT Service Continuity Management – Security Management – Definition – Process – Metrics – Roles – Tools.

UNIT-IV : Principles of Information Security Management System (ISMS)

Introduction to ISMS – Why we need ISMS – Benefits of ISMS – Scope-Gap Analysis – PT & VA concepts – Security Incident Management.

UNIT-V : Risk Management

ISMS – Asset identification – Risk identification – Risk treatment plan – SOA – Security policies.

Text Book :

- Micki Krause, Harold F. Tipton, Handbook of Information Security Management (ISMS) CRC Press LLC Im Print : Auerbach Publication, 2000.
- Rob Addy, Springer Link, Effective IT Service Management to ITIL and Beyond, Published by Springe, 2007.

References :

- Harold F. Tipton, Mickjekrause, Information Security Management, CRC Press, 2006.
- Standards Manual – BSI, ISO 20000 : 2005.
- Standards Manual – BSI, ISO 27001 : 2005.

Web Services: www.itil-officialsite.com www.itil.co.uk www.isms.biz www.qcin.org

PAPER III - ENTERPRISE SYSTEMS MANAGEMENT TOOLS

Prerequisite : Service and Security Management of Information Technology

UNIT-I : Remote Infrastructue Monitoring and Management (RIMM)

Definition – RIM, Need for RIM. What is Monitoring ? Network Management Requirements, Network Monitoring, SNMP (V1, V2, V3), RMON (1&2).

UNIT-II : Network Operation Center and security Operation center

NOC & SOC Definition, NOC Features & Benefits, Functions of NOC, SOC Features & Benefits, Functions of SOC.

UNIT-III : RIMM Tools implementation and configuration

Tools Introduction, Monitoring & Management Tools and Parameters to be monitored, Different tools to Monitor & Manage the Infrastructure (OP Manager, Netview, whatsupgold, spotlight, SCOM, MRTG, PRTG, Network Health, Solar winds etc.), Agent based & Agent less Monitoring, Reporting.

UNIT-IV : Trouble Ticketing Management System Tools Implementation and Configuration

TTMS – Definition, Implementing ITIL Compliance TTMS System, Help Desk, Service Desk, TTMS Tools (CA Service Desk, Servdesk plus etc.).

UNIT-V : Infrastructure Management Process

Help Desk, Classification of the Issues, Monitoring & Managing the infrastructure, Fully Automated & Semi Automated Management Down Time Maintenance, Roles & Responsibilities.

Text Book :

- Heinz-Gerd Hegering, Sebastian Abeck, Bernhard Neumair, Integrated Management of Networked Systems, Published by Morgan Kaufmann, 1999.

References :

- Micki Krause, Harold F. Tipton, Handbook of Information Security Management (ISMS) CRC Press LLC Im Print : Auerbach Publication, 2000.
- William Stallings, SNMP, SNMP V2, SNMP V3 and RMON1 and 2 (3rd Edition), Publisher : Addison-Wesley Professional : 3 Editions (January 1, 1999).

Web Services: www.cisco.com www.ibm.com www.hp.com

COMPUTER LAB-I - SERVICE AND SECURITY MANAGEMENT OF INFORMATION TECHNOLOGY

Prerequisite : Service and security Management of Information Technology Theory

1. Windows Desktop Properties
2. My Computer Properties
3. Control Panel
4. Computer Management
5. Sharing & Security Permissions
6. Printer Management
7. Backup and Restore
8. Implementing ITIL Process in Ticketing System
9. Incident Management
10. Problem Management
11. Configuration Management

COMPUTER LAB-II - ENTERPRISE SYSTEM MANAGEMENT TOOLS

Prerequisite : Enterprise System Management Tools Theory

1. Implementing Monitoring Tools
2. Configuring Network Traffic Monitoring
3. Configuring windows Systems Monitoring
4. Configuring Services Monitoring
5. Configuring Network Devices Monitoring
6. Data Base Monitoring
7. OS Monitoring
8. Application Monitoring
9. Mail Service Monitoring
10. WAN link UP and Down and Traffic Monitoring

OPTIONAL SUBJECTS

OPTION (A) - NETWORKING STREAM

PAPER IV - NETWORK ROUTING

Prerequisite : Enterprise System Management Tools

UNIT-I : Networking Layers

Networking Basics – Benefits of Networking – OSI Model – TCP/IP Model – Introduction to Important TCP/IP Protocols – IP Addressing – Subnetting – VLSM – CIDR.

UNIT-II : Basics of Routing

Introduction to Router – Routing concepts – Static Routing – Default Routing – Dynamic Routing – Administrative Distances – Routing Loops – Maximum Hop Count – Split Horizon – Route Poisoning – Hold downs Timers.

UNIT-III : Dynamic routing – Routing Information Protocol (RIP) & Interior Gateway Routing Protocol (IGRP)

Benefits of Dynamic Routing – Introduction to Dynamic Routing Protocols – RIP – IGRP – Configuring RIP and IGRP Routing – Verifying the RIP and IGRP Routing Tables – Troubleshooting RIP and IGRP.

UNIT-IV : Dynamic Routing – Enhanced Interior Gateway Routing Protocol (EIGRP) & Open Shortest Path First (OSPF)

EIGRP – OSPF – Hybrid Protocol – Diffusing Update Algorithm – Neighbour Discovery – OSPF Terminology – SPF – Enabling OSPF Areas – OSPF and Loop back interfaces – Configuring EIGRP and OSPF – Verifying EIGRP and OSPF tables.

UNIT-V : Wide Area Network (WAN) Protocols

Introduction to WAN Protocols – HDLC – PPP – Frame relay – ISDN – Access control list – Standard – Extended Access control list – NAT Concepts – Static NAT – Dynamic NAT – PAT.

Text Book :

- Todd Lammle, Routing, Ref. Book – CCNA Study Guide (640-802), CISCO Press, 2007.

References :

- Diane Teare, Catherine Paquet, Building Scalable Cisco Internetworks (BSCI), Cisco Press, 2007.
- Jeff Doyle, Routing TCP/IP Volume I, Cisco Press, 2005.

Web Services : www.cisco.com

PAPER V - NETWORK SWITCHING

Prerequisite : Network Routing

UNIT-I : Switching Concepts

Switching concepts – MAC Table – Half Duplex – Full Duplex – Fast Ethernet – Gigabit Ethernet – 10-Gigabit Ethernet – Console port – Ethernet port speed – Broadcast domain.

UNIT-II : Virtual Local Area Network (VLAN) and Trunks

VTP – VLAN – VLAN Membership – Static VLAN – Dynamic VLAN – VLAN Frame Identification – Inter Switch Protocol – IEEE 802.1Q Protocol – Dynamic Trunking Protocol – VTP Domain – VTP Modes – VTP Advertisements.

UNIT-III : Inter Virtual Local Area Network (VLAN) Routing

Inter VLAN Routing – Multi Layer Switch – Inter VLAN Communication with router – Inter VLAN Communication with multi layer switch.

UNIT-IV : Spanning Tree Protocols

Concepts of STP – Root bridge – Root Port – STP Timers – Port fast – Root guard – BPDU Guard – Port States – Blocking – Listening – Learning – Forwarding – RSTP – BPDU in RSTP – RSTP convergence.

UNIT-V : High Availability

Redundancy with Hot Standby Routing Protocol (HSRP) – Load Balancing with HSRP – Redundancy with VRRP & GLBP – Switch Security – STP Security Mechanisms.

Text Book :

- David Hucaby, Switching, Ref. Book – BCMSN Study Guide (642-812) CISCO Press, 2007.

References :

- Richard Froom, Balaji Sivasubramanian, Erum Frahim CCNP BCMSN, CISCO Press, 2007.
- Wayne Lewis, Switching Basics and Intermediate Routing CCNA 3 Companion Guide, CISCO Press, 2006.

Web Services: www.cisco.com

PAPER VI - WIDE AREA NETWORK SECURITY

Prerequisite : Network switching

UNIT-I : Cable Technology

Cable System Standards – Cable Features – Coaxial Cable – Digital Signals over RF Channels – Data over Cable – Hybrid Fiber – Coaxial Networks – Cable Technology issues – Provision cable modems.

UNIT-II : Digital Subscriber Line (DSL) Technology

DSL Features – DSL Limitations – ADSL Basic – Phase – Splitter – Upstream – Downstream – Modulation – Demodulation – Asymmetric DSL Types – ADSL – VDSL – HDSL – IDSL – CAP – DMT – PPPOE – PPPOA Etc.

UNIT-III : Internet Protocol Security (IPSec) Virtual Private Network (VPN)

VPN Basic – Data confidentiality – Data integrity – Data authentication – Data authorization – IPSec Protocols – IKE – ESP – AH – Transport mode – Tunneling Mode – Peer Authentication – Username and password – One-time password – Biometrics – Preshared Keys – Digital Certificates – Symmetric Encryption – Asymmetric Encryption – DES – 3DES – AES – Public Key Infrastructure.

UNIT-IV : Network Attacks

Network Attacks – Reconnaissance – Mitigating Network Attacks – Virus – Wtorm – Trojan Horse – Packet Sniffers – Port Scan – Ping Sweep – Dos Attacks – TCP SYN Attack – Password Attack – Port Redirection – Man in the Middle Attack – IP Spoofing – Mitigating Management Protocols – SSH.

UNIT-V : Firewall

Firewall Technology Basic – Packet Filtering – Stateful Packet Filtering – CISCO IOS Firewall – DMZ –IPS – IDS concept.

Text Book :

- Brain Morgan, / Neil Lovering, Secure Wide Area Networks, Ref. Book – ISCW Study Guide (642-825), CISCO Press, 2008.

References :

- Brain Morgan, CCNP BCRAN, CISCO Press, 2006.
- Gert De Laet, Gert Schauwers, Network Security Fundamentals, CISCO Press, 2004.

Web Services: www.cisco.com

COMPUTER LAB-III - NETWORK ROUTING

Prerequisite : Network Routing Theory

1. Configuring IP Addressing
2. Managing Router
3. Configuring Static Routing
4. Configuring Default Routing
5. Configuring RIP
6. Configuring IGRP
7. Configuring EIGRP
8. Configuring OSPF
9. Configuring WAN Protocols
10. Configuring NAT
11. Configuring ACL

COMPUTER LAB-IV - NETWORK SWITCHING

Prerequisite : Network Switching Theory

1. Configuring and verifying basic switch commands
2. Configuring VLAN
3. Configuring Inter VLAN Routing with Router
4. Configuring Inter VLAN Routing with Layer 3 Switch
5. Configuring HSRP
6. Configuring VRRP
7. Configuring GLBP
8. Configuring RSTP
9. Configuring Switches for secure communication

COMPUTER LAB-V - WIDE AREA NETWORK SECURITY

Prerequisite : Wide Area Network Security Theory

1. Configuring IPsec VPN
2. Configuring VPN Tunnels
3. Configure to mitigate Password Attacks
4. Configure to mitigate Port-scan Attacks
5. Configure to mitigate Application Layer Attacks
6. Configure to mitigate Virus, Worm and Trojan Horse Attacks
7. Configure IOS Secure Management – SSH, SNMP etc
8. Configure Firewall
9. Configure two interface firewall
10. Configure Auto Secure

OPTION (B) – UNIX STREAM

PAPER IV - IBM ADVANCED AIX ADMINISTRATION

Prerequisite : Enterprise System Management Tools

UNIT-I : Principles of UNIX

File System overview – Working with files and directories – Streams and display commands – File manipulation and process commands – Working with VI editors.

UNIT-II : AIX Basics

RISC Architecture – Terminologies – Configurations available with RS6000-roles of System Administrator – System Startup and Shutdown – System Startup Process – Shutdown Procedures – Contents of etc file systems – Installation types – AIX Base Installation – Types of Installation, Devices – device types, logical and physical devices, states of devices and location codes.

UNIT-III : File System Management

Logical Volume Manager – Volume groups, Physical volumes, Logical volumes, Logical partitions, Physical partitions – File Systems – Components of file systems, adding JFS/JFS2 file systems, managing file systems, disk space usage, file system integrity check.

UNIT-IV : Backup and Restore

Media used for backup – Different types of backup – Backup methods through SMIT and command line backing and restoring – Root volume group and Non root volume group.

UNIT-V : Administration and Performance Monitoring

User Administration, managing paging spaces – Need for paging space in AIX, list and monitor paging space utilization – Performance Monitoring – CPU bottlenecks, I/O bottlenecks, Generating system activity reports.

Text Book :

- Randal K. Michael, AIX 5L Administration, Osborne Publishing & McGraw- Hill/Osborne Media, 2002.

References :

- Christian Pruet, Kristian Stickland, Scott Vetgter, IBM e server P Series AIX Administration, 2001.
- Jose Eduardo Martinez cardio, IBM certification study guide P5 and P series administration & support for AIX 5L, Version 5.3, Published by Verante, 2006, ISBN 07384496499, 9780738496498.

Web Source : www.ibm.com <http://auk.uwaterloo.co/aixgroup>
<http://www.emerson.emovj.edu/services/aix-faq/>

PAPER V - SUN SOLARIS ADMINISTRATION

Prerequisite : IBM AIX Advanced Administration

UNIT-I : Fundamentals of Solaris OS

Describing root sub directories, file components, file types, using hard links Managing Local Disk drives – Basic architecture of disk, Naming convention of disks, performing disk partitioning, managing disks using Solaris management console.

UNIT-II : Managing Solaris OS File Systems

Describing Solaris OS files systems, creating file systems and file system integrity check, monitoring file system usage, Performing Mounting and unmounting – access a mounted disk or CDROM, restricting access of disk or CDROM without Volume Management.

UNIT-III : Installation and Package Administration

Identifying fundamentals of Solaris CD ROM installation, Installing Solaris OS from CD ROM, Package Administration – package administration fundamentals and administrating through command line interface, Patch Administration installing removing Patches.

UNIT-IV : System Administration and Security

Describing user administration fundamentals, managing user accounts, manage initialization files, System Security – Monitor system access, switch user on a system, control system access, restrict access to data file.

UNIT-V : File System Backup and Restore

Identifying fundamentals of backups, backing up mounted and Unmounted file systems, creating and backing up UFS Snapshot, Restoring UFS file systems, disaster recovery Fundamentals, Commands related to Backup and Restore.

Text Book :

- Dr. Paul A. Watters, The Complete Reference Solaris-10, TATA MCGRAW HILL Edition, 2005.

References :

- Paul A. Watters, Solaris 9 Administration – a beginner's guide, Published by McGraw Hill / Osborne, 2002.
- Sandra Henry-Stocker, Evan R. Marks, Solaris 9 System Administration, Dreamtech India Pvt. Ltd., 2003.

Web Services : www.ibm.com

PAPER VI - DATA STORAGE MANAGEMENT

Prerequisite : SUN Solaris Administration

UNIT-I : Storage Basics

Data Backup, restore and recovery options, storage resource management, goals and objectives, Storage Major Processes, Planning a backup strategy, Planning and data Storage, growth and defining backup requirements.

UNIT-II : Basics of Redundancy Array of Inexpensive Disk

Redundancy Array of Inexpensive Disk techniques – Different RAID levels, Just a Bunch Of Disks.

UNIT-III : Fundamentals of Storage Area Network

Introduction to Storage Area Network and setting up Storage area network, Introduction to Network Attached Storage, Comparison between SAN and NAS.

UNIT-IV : Fundamentals of Tivoli Storage Manager

Tivoli Storage Manager – Introduction, features and functionalities, backup methodologies used in TSM, LTO – Introduction to LTO tape drives, different LTO tape drive models, backing up data in tape drives. Defining libraries for LTO tape drives.

UNIT-V : Tivoli Storage Manager BACKUP and RESTORE

Different methods of backup through Command line and GUI, Archiving data items through command line and GUI, Different methods of restoring data through command line and GUI, Restoring Archive items through command line and GUI, Backup and Restore Option.

Text Book :

- Tom Clark, Virtual Storage : Technologies for simplifying data storage & management, Published by Addison Wesley, 2005.

References :

- Roland Tretau, Aezil Andal, Ross Battaglia, Dan Edwards, Holger Speh, IBM Tivoli Storage Manager Implementation Guide, IBM, 2003.
- Tivoli Storage Manager Quick Start – Version 5.2, Ref. Book – IBM Redbooks.

Web Services : www.ibm.com

COMPUTER LAB-III - IBM ADVANCED AIX ADMINISTRATION

Prerequisite : IBM Advanced AIX Administration Theory

1. Basic Unix Commands
2. Installation and Pre Planning
3. LVM Determination
4. Disk Management
5. Performance Monitoring and Administration
6. NIC Configuration
7. User Administration
8. Backup and Restore

COMPUTER LAB-IV - SUN SOLARIS ADMINISTRATION

Prerequisite : SUN Solaris Administration Theory

1. Basic Solaris commands
2. Disk Management
3. Solaris Volume Manager Management
4. Installation and Pre Planning
5. User Accounts Management
6. File System Management
7. NIC Configuration
8. Performing Backup and Restore

COMPUTER LAB-V - DATA STORAGE MANAGEMENT

Prerequisite : Data Storage Management Theory

1. Implementing Storage Management Techniques
2. Performing Backup and Restore using TSM
3. Proposed DR Plan
4. Storage Pools
5. Device Class
6. Management Class
7. Installing TSM
8. Configuring TSM Server and Client
9. Scheduling Backup
10. Defining Tape Library

2. POST-GRADUATE DIPLOMA IN ENTERPRISE COMPUTING

CORE COURSES

(Common to OPTION (A) IBM Mainframe Application Software,
OPTION (B) IBM Mainframe System Management, and
OPTION (C) IBM Mainframe Database Administration)

PAPER I - ENTERPRISE MAINFRAME TECHNOLOGIES

Prerequisite : Admission

UNIT-I : Fundamentals of Enterprise Computing

Introduction to Enterprise Computing – Enterprise information and its flow – Categories – Management activities – Information system – Functional units.

UNIT-II : Enterprise Information System

Introduction to Enterprise Information System – Examples – Management Information Systems (MIS) – Decision Support Systems (DSS) – Expert Systems (ES), Software Development Life Cycle (SDLC) – Life cycle models – Phases of SDLC – Project Handling methodologies using SDLC.

UNIT-III : Process Innovation and Management

Introduction of Process innovation and Management – Integrating Information System – Management of IT Organizations, Change management, incident management, Operation, Service, Problem Management and Service Level Agreement.

UNIT-IV : Enterprise Technologies

Introduction to Enterprise wide technologies – Enterprise Hardware – High availability – Scalability – Storage – Security.

UNIT-V : Evolution of Mainframes

History and Evolution of Mainframes – Central storage – Virtual storage – Auxiliary storage – Channel – Logical Partition – Job Management.

Text Book :

- Andrew Hunt and David Thomas, The Pragmatic Programmer : From Journeyman to Master.

References :

- Erich Gamma, Design Patterns : Elements of Reusable object oriented software.
- Martin Fowler, Refactoring : Improving the design of existing code.

Web Services : www.ieee.org

PAPER II - FUNDAMENTALS OF MANFRAME OPERATING SYSTEMS

Prerequisite : Enterprise Mainframe Technology Theory

UNIT-I : Time Sharing Option (TSO)

Introduction to TSO – An Introduction to Interactive System Program Development Facility (ISPF) – Logon and Logoff – Types of Dataset – Creation/Deletion of dataset – Retrieving dataset.

UNIT-II : Job Control Language (JCL) Fundamentals

Basics of JCL – Features – Statement Format – Types of Statements – Parameters – Creation, allocation and manipulation of Different types of data set.

UNIT-III : Job Control Utilities

IBM Utilities – IEFBR14, IEBGENER, IEBEDIT, IEBCOMPR, IEHPROGM, IEHINITT, IEHLIST.

UNIT-IV : Sort and Merge Utilities

Sort and Merge operations – SORT utilities – DFSORT, ICETOOL – MERGE utility.

UNIT-V : Procedures

In-Stream Procedures – Cataloged Procedures – Uses – Condition Statements.

Text Book :

- Dreamtech Software Team, IBM Mainframe Black Book, Dreamtech press, 2007.
- Doug Lowe, Murach's MVS TSO Concepts and ISPF Murach's Publication.
- Saba Zamir and Chander Ranade, MVS JCL Primer.

References :

- Raul Menendez and Doug Lowe, Murach's OS/390 and z/OS JCL – Mike Murach Associates (2002).
- Edward Anthony, Introduction to TSO/ISPF.
- Doug Lowe, MVS TSO commands & procedures.
- Gabriel F Gargiulo, MVS TSO Mastering Native Mode & ISPF.
- Doug Lowe, MVS JCL, 1994.
- Donna Kelly and Jim Harding, MVS JCL in Plain English, 2002.
- Gary Deward Brown, System 390 Job Control Language 4th Edition, 1998.
- Olivia R Carwandi, MVS TSO OS/390 Quick Reference Guide Mainframe Technical Series.

Web Services : www.ibmmainframes.com

PAPER III - MAINFRAME DATA ORGANIZATION

Prerequisite : Mainframe Operating Systems Fundamentals

UNIT-I : Mainframe Architecture

Mainframe Architecture – 24, 31, 64 bit Addressing – Advantages of z/Architecture – Features of z/Series servers & z/OS.

UNIT-II : Virtual Storage Access Methods

Introduction – Access Methods – Organization – Control Intervals – Control Area – Access Method Services.

UNIT-III : Virtual Storage Access Method Data Sets

VSAM Data Sets – Types – Parameters for IDCAMS – Alternate Index.

UNIT-IV : Generation Data Groups (GDG)

Introduction to GDG – Creation of GDG – Versions of GDG.

UNIT-V : Virtual Storage Access Method Data Set Maintenance

List catalog – Verify – Importing & Exporting the Data sets.

Text Book :

- Dreamtech Software Team, IBM Mainframe Black Book, Dreamtech Press, 2007.
- Doug Lowe, VSAM for the COBOL Programmer.

References :

- Doug Lowe, VSAM Access Method Services & Application Programming, 1986.

Web Services : www.ibmmainframes.com

COMPUTER LAB-I - FUNDAMENTALS OF MAINFRAME OPERATING SYSTEMS

Prerequisite : Fundamentals of Mainframe Operating Systems Theory

1. Steps to logon and logoff to a TSO session
2. Primary option menu
3. Creating, Editing and browsing of data set – Types
4. Line and Browse Commands
5. Allocation of different types of Data sets using IEFBR14 utility
6. Copying sequential data sets and concatenating the data sets using IEBGENER utility
7. Copying Partitioned data sets and compressing them using IEBCOPY utility
8. Working with Sort and Merge statements
9. Working with In-stream procedures
10. Working with cataloged procedures

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COMPUTER LAB-II - MAINFRAME DATA ORGANIZATION

Prerequisite : Mainframe Data Organization Theory

1. Defining and populating ESDS VSAM Data Sets using IDCAMS utility
2. Defining and populating RRDS VSAM Data Sets using IDCAMS utility
3. Defining and populating KSDS VSAM Data Sets using IDCAMS utility
4. Defining and populating AIX VSAM Data Sets using IDCAMS utility
5. Defining a Generation Data Group
6. Creating different versions using a Generation Data Group
7. Writing a program to list the catalogued information for a data set
8. Writing a program to verify the details of a catalogued data set
9. Writing a program to export and import the Data Set

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OPTIONAL SUBJECTS

OPTION (A) – IBM MAINFRAME APPLICATION SOFTWARE

PAPER IV - MAINFRAME COBOL PROGRAMMING

Prerequisite: Mainframe Data Organization

UNIT-I : Introduction to COBOL

Nature of COBOL – Usages in the real world – Features – Divisions – Variables – Figurative constants – Coding rules – JCL for COBOL.

UNIT-II : Data Types

Data types – Arithmetic verbs – Edited Picture clause – Move statements and its types – Usage clause and its types – Types of Condition statements – String – Unstring – Inspect and its types.

UNIT-III : Loop Statements

Types of Perform statements – Array Handling – Dimensions – Search and its types.

UNIT-IV : File Handling

Handling sequential files – VSAM files – Organization – Access Modes.

UNIT-V : Subroutines and functions

Sub Programs – Call statements and its types – Passing parameters through JCL – Global and external variables – intrinsic functions.

Text Book :

- Dreamtech Software Team, IBM Mainframe Black Book, Dreamtech Press, 2007.
- M.K. Roy and D. Ghosh Dastidar COBOL Programming.

References :

- Mike Murach, Anne Prince and Raul Menendez, Murach's Mainframe COBOL, 2004.
- Nancy Steru, Robert A Stem and James P Ley, COBOL for the 21st Century, 2005.
- Mike Murach, Anne Prince, Murach's Ststructured COBOL, 2000.
- Tkane Hubball, Sams Teach Yourself COBOL, 1998.

Web Services : www.ibmmainframes.com

PAPER V - MAINFRAME DATABASE (DB2) MANAGEMENT

Prerequisite: Mainframe COBOL Programming

UNIT-I : Basics of Database (DB2) and its types

Introduction to DBMS – RDBMS – Constraints – DB2 in Mainframes – DB2 Objects – Normalization.

UNIT-II : Structured Query Language (SQL)

SQL statements – Data types – Database design - Data Definition Language, Data Manipulation Language, Data Control Language and Retrieval.

UNIT-III : Fundamentals of Program Preparation

Using SQL in an application program, cursors etc – Program Preparation – Pre-compilation, Bind – Application concepts – Commit rollback – Concept of Isolation levels.

UNIT-IV : Embedded SQL

Singleton sets and its types – Cursors and its types – JCL for DB2.

UNIT-V : Dynamic SQL

Execute Immediate – Prepare and Execute – Fixed List Select – varying list select.

Text Book :

- Dreamtech Software Team, IBM Mainframe Black Book, Dreamtech Press, 2007.
- C.J Date and Colin J. White, A Guide to DB2, Fourth Edition.

References :

- Curtis Garrin, Anne Prince & Steve Eckols Part I & II, DB2 for the Cobol Programmers, 1998.
- Raul F Chong, Xiaomei Wang, Understanding DB2, 2008.
- Craig S Mullins, DB2 Developers Guide, 2004.

Web Services : www.ibmmainframes.com

PAPER VI - ON-LINE TRANSACTION PROCESSING

Prerequisite : Mainframe Database(DB2) Management**UNIT-I : Basics of Customer Information Control System (CICS)**

Introduction to CICS – Batch vs Online Processing – CICS Programs and Tables – Initiating a CICS Transaction – Send and Receive commands – Handling exceptions – JCL for CICS.

UNIT-II : Design of Screen Maps

Normal and Pseudo conversation – Basic Mapping Support – Types of Maps and its creations using Macros – Map and Map sets – CICS commands to send and receive Maps – JCL for Maps.

UNIT-III : File Handling

Accessing VSAM Data sets – Handling Files in CICS region – Describing and handling File Control Table.

UNIT-IV : Queues

Transient Data Queue – Temporary Storage Queue – Properties.

UNIT-V : Communication between CICS and DB2

Accessing DB2 in CICS region – JCL for CICS with DB2 – Sub programs – Link – XCTL.

Text Book :

- Dreamtech Software Team, IBM Mainframe Black Book, Dreamtech Press, 2007.
- Yukihiisa Kageyama, CICS Hand Book, 1989.

References :

- Raul Menendez & Doug Lowe, Murach's CICS Desk Reference, 2002.
- Doug Lowe, CICS for the Cobol Programmer – An Introductory Course, 1992.
- CICS Command Level Programming – Alida M JatichWiley Professional Computing, 1991.
- James G. Janossyand Steve Samuels, CICS / ESA Primer, 1995.
- JJohn Horswilland Sue Miller, Designing & Programming CICS Applications, 2000.
- Raul Menendez & Doug Lowe, Murach's CICS for the COBOL Programmes, 2001.

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COMPUTER LAB III - COBOL PROGRAMMING

Prerequisite : Mainframe COBOL Programming Theory

1. To accept a string from JCL and display it in the spool area.
2. Programs to accept inputs from JCL and perform different arithmetic operations and display the result in the spool area in an appropriate edited format.
3. Programs to evaluate a string that uses the respective condition statements. For example : Date validation.
4. Programs to accept different inputs and print the statements repeatedly using Perform statements.
5. Programs to implement single and multi dimension arrays from inputs obtained through JCL. For example : Matrix multiplication.
6. Programs to manipulate strings using the keywords String, Unstring and Inspect.

7. Programs to search a data using Liner and Binary search.
8. Programs to access different VSAM data sets using Primary or Alternate keys for generating the reports.
9. Programs to demonstrate the static and dynamic calls statements using subprograms.
10. Programs to demonstrate the use of functions.

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COMPUTER LAB IV - MAINFRAME DATABASE (DB2) MANAGEMENT

Prerequisite: Mainframe Database (DB2) Management Theory

1. Working with SPUFI, QMF and DCL Generator.
2. Working with DDL type of SQL queries.
3. Working with DML type of SQL queries.
4. Working with DCL type of SQL queries.
5. Working with Retrieval type of SQL queries.
6. Working a JCL for embedding both SQL and the COBOL program. The JCL will have the respective procedure, the binding step and the plan creation.
7. Working with DCL Generator to convert the SQL queries into COBOL equivalent words.
8. Programs to fetch or to insert a single row using Singleton set.
9. Programs to fetch / manipulate multiple rows using Cursor option.
10. Programs to create a plan using different methods with the help of Dynamic SQL.

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COMPUTER LAB V - ON-LINE TRANSACTION PROCESSING

Prerequisite: On-line Transaction Processing Theory

1. Programs to send and receive messages from TSO to CICS region using different options.
2. Programs to handle exception conditions.
3. Programs to use the Pseudo conversational techniques.
4. Programs to create and work with Maps.
5. Programs to create and work with VSAM Data sets.
6. Programs to work with TDQ.
7. Programs to work with TSQ.
8. Programs to communicate with DB2 using CICS.
9. Programs to work with Sub Programs and passing data through link communication area.
10. Programs to work with Sub Programs and passing data through XCTL communication area.

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OPTION (B) – IBM MAINFRAME SYSTEM MANAGEMENT

PAPER IV - PRINCIPLES OF MAINFRAME OPERATION

Prerequisite : Mainframe Data Organization

UNIT-I : z/Series Architecture & z/OS Operating System

Introduction to Mainframe OS and its components – Concept of virtual storage and its exploitation in z/OS – Different kinds of data sets and dataset management in z/OS – End user interfaces of z/OS – Characteristics of the z/Series processors – Overview of z/OS, its components and delivery process.

UNIT-II : Job Entry Subsystem (JES)

Introduction to JES – JES2 and JES3 – Differences between JES2 and JES3 – JES2 messages – Basic JES2 commands – TSO/E sessions and Interactive System Productivity Facility/Program Development Facility (ISPF/PDF) panels – System Display and Search Facility (SDSF) to view held job output and view the system log.

UNIT-III : Mainframe Initialization and Shutdown

Introduction to system initialization – Steps of Initial Program Load – Functions performed by the Nucleus Initialization Program (NIP) to initialize the system – Responding to NIP messages – Load of any z/OS system – Purpose of the system initialization – Roles of SYS1, PARMLIB, SYS1.LPALIB, SYS1.NUCLEUS and System Resident Volume (SYSRES) in the system initialization process – Purpose of the system address spaces created during the IPL process.

UNIT-IV : Hardware Management Console (HMC) & z/OS Consoles Operation

Introduction to HMC – Opening objects and dragging and dropping on the HMC – logging on and logging off the HMC – Using the HMC books function – Using the HMC help function.

Status and parameters of any console – recovery procedures for console error conditions – z/OS commands.

UNIT-V : Storage Management

Introduction to Storage Management – Volume Initialization – Backup/Restore (Logical & Physical) – General Dataset Maintenance – Deleting Log Datasets – Deleting Old Datasets – Moving Datasets between Volumes – DASD Maintenance – Defrag, Compress, Free – Tape Initialization.

Text Book :

- Paul Rogers, Miriam Gelinski, Joao Natalino Oliveira, Valeria Sokal, ABC's of z/OS System Programming Volume 1, International Technical Support Organization, December 2003.
- Paul Rogers, Miriam Gelinski, Sergio Munchen, Monica Mataruco, Julio Grecco Neto, Joao Natalino Oliveira, Antonio Orsi, ABC's of z/OS System Programming Volume 2, International Technical Support Organization, January 2006.
- Paul Rogers, Redelf Janssen, Andre Otto, Rita Pleus, Alvaro Salla, Valeria Sokal, ABC's of z/OS System Programming Volume 3, International Technical Support Organization, August 2007.

References :

- Mike Ebbers, Wayne O'Brien, Bill Ogden, Introduction the New Mainframe : z/OS Basics, International Technical Support Organization, July 2006.
- Lydia Parziale, Eli M. Dow, Klaus Egeler, Jason J. Herne, Clive Jordan, Edi Lopes Alves, Eravimangalath P. Naveen Manoj S Pattabhiraman, Kyle Smit, Introduction the New Mainframe. z/VM Basics, International Technical Support Organization, September 2007.
- IBM Team, MVS Initialization and Tuning Reference, International Technical Support Organization, April 2007.

Web Services : www.redbooks.ibm.com

PAPER V - MAINFRAME SECURITY MANAGEMENT

Prerequisite : Principles of Mainframe Operation Theory

UNIT-I : Introduction to Security

Basic components of cryptography – Benefits of digital certificates – Secure Sockets Layer (SSL) uses digital certificates – LDAP Server – Introduction and Definition of RACF – Concept of Resource Classes – Concept of RACF Profiles – Identifying and Authenticating Users – Authorizing Access to Resources by Users – Recording and Reporting Access Attempts.

UNIT-II : Resource Control access facility Users

Definition of User ID and User Profile – Logging Onto the System with User ID and Password – The LISTUSER (LU) TSO Command to List User Details – Concept of Segments in User Profile – Description of Segment Information – TSO Segment – CICS Segment – The LISTUSER (LU) TSO Command to List Segment Details.

UNIT-III : Resource Control access facility Groups

Definition of Group and Group Profile – Definition of default and Connect Groups – Definition of Group Authorities – Group Profile and Segments.

UNIT-IV : Protecting Data Sets & General Resources

Data Set Resource Class – Data Set Profiles – Types of Access to Data Sets – Concept of Access Lists – Examples of Types of General Resources – DASD Volumes – Global access tabled, Class descriptor table – Structure of the RACF database.

UNIT-V : Resource Control access facility auditing

RACF Utilities – System Management Facility (SMF) data unload utility – Auditing Concepts – DSMON – LIST command.

Text Book :

- Paul Rogers, Rui Feio, Orjan Lundgren, Rita Pleus, Karan Singh, ABC's of z/OS System Programming, Volume 6, International Technical Support Organization, March 2008.

References :

- IBM Team, z/OS Security Server RACF Security Administrator’s Guide, IBM, January 2007.
- IBM Team, z/OS Security Server RACF System Programmer’s Guide, IBM, September 2006.
- IBM Team, z/OS Security Server RACF Command Language Reference, IBM, September 2006.
- IBM Team, RACF Starter System for MVS, ITSO, September 1992.

Web Services : www.redbooks.ibm.com

PAPER VI - MAINFRAME NETWORKING

Prerequisite : Mainframe Security Management

UNIT-I : Basics of Networking Layers

Introduction to TCP/IP layers – Customization of TCP/IP and profiles. Describe TCP/IP concepts – Customization of TCP/IP profile in z/OS.

UNIT-II : Basics of Systems Network Architecture

Basics of Systems Network Architecture (SNA) concept – Time Sharing Option (TSO) environment definition to z/OS and Virtual Telecommunications Access Method (VTAM) – Customization of VTAM.

UNIT-III : Basics of Sysplex

Introduction to Sysplex – Software components of a Parallel Sysplex – Hardware components of a Parallel Sysplex – Determining the operational state of the sysplex.

UNIT-IV : Basics of Database (DB2) Operation

Overview of DB2 basic operation - Identifying system messages issued by all subsystems like DB2.

UNIT-V : Basics of Online Transaction processing (CICS) Operation

Overview of CICS basic operations - Identifying system messages issued by all subsystems like CICS.

Text Book :

- Paul Rogers, Paola Bri, Luiz Fadel, Andreas Horn, Redelf Janssen, Valeria Sokal, Thomas Stoeckel, ABC’s of z/OS System Programming Volume 5, International Technical Support Organization, December 2005.
- Lydia Parziale, David T. Britt, Chuck Davis, Jason Forrester, Wei Liu, Carolyn Mathews, Nicolas Rosselot, TCP/IP Tutorial and Technical Overview, International Technical Support Organization, December 2006.

References :

- Stephen Hochstetler, JunHeum Min, Matt Robbins, Nancy Milliner, Narend Chand, Syamsul Hidayat, HMC Handbook, International Technical Support Organization, July 2007.
- Bill White, Marian Gasparovic, Dick Jorna, System Z Connectivity Handbook, International Technical Support Organization, July 2007.
- Bill White, Yukihiro Miyamoto, Gilson Cesar de Oliveira, Roland Peschke, Communication Server for z/OS TCP/IP, Implementation Volume 1, International Technical Support Organization, December 2006.

Web Services : www.redbooks.ibm.com

COMPUTER LAB III - PRINCIPLES OF MAINFRAME OPERATION

Prerequisite: Principles of Mainframe Operation Theory

1. Document on the various delivery options available for z/OS.
2. Analyse the different Parmlib Members and list the methods used to customize these members.
3. Analyse the SYSLOG and prepare a report on the order in which the every subsystem is invoked.
4. Distinguish between different types of IPL and the means to identify them from the SYSLOG. Prepare a report detailing when and how IPL is done.
5. Complete the following table with inputs from the SYSLOG.

Subsystem Name	Invocation	Command to start	Parameter	Invoked procedure	Invoked program	Parmlib	Address Space	Command to shutdown
All Mainframe Subsystems	Manual / Automatic		If any			If any	MSTR / JES	

6. Attend a Demonstration session of the Initial Program Load.
7. Try out the various JES Display Commands.
8. Prepare the job card for the following :
 - a. Volume Initialization
 - b. Data Backup
 - c. Data Restore
 - d. Dataset Deletion
 - e. Defragmentation, Compress & Release
 - f. Tape Initialization
9. Attend a demonstration session on Storage Management.
10. Attend a demonstration session on HMC Elements.

Text Book :

- IBM Team, MVS/ESA HCD and DynamicI/O Reconfiguration Primer, International Technical Support Organization, February 1966.
- IBM Team, DFSMSDss Storage Administration Guide, IBM, April 2006.

References :

- IBM Team, DFSMSDss Storage Administration Guide, IBM, April 2006.
- IBM Team, JES2 Commands, IBM, April 2006.

Web Services : www.redbooks.ibm.com

COMPUTER LAB IV - MAINFRAME SECURITY MANAGEMENT (RACF)

1. Prepare the job card for submission of RACF related jobs. Get the approval from the lab faculty before proceeding further.
2. Create a group under the superior group and owner specified by the lab faculty. List the group and note the information displayed on screen.
3. Change the owner of the group so that your user ID owns the group.
4. Create a user under the Group created. List the group and user information of both the group and user created and note the differences in the group profile now. Try logging in with the user ID created. Go through any messages displayed on screen.
5. Change the name parameter in the user ID created.
6. Prepare the job card for creating an alias. Get the approval from the lab faculty before proceeding further. Define an alias for the user created. Now try logging with the user ID. Go through any messages displayed on screen.
7. Create a dataset profile for the user ID created. Permit your user ID to access the datasets of the new user. List the dataset profile and note the differences. Change the Universal Access Authority of the dataset profile. List the dataset profile and note the differences.
8. Create another group under superior group specified by the lab faculty. Change the default group of the user ID created to the second group.
9. Candidates should prepare a document listing all possible profiles (max 5) that can be defined under specific general resource classes provided by the lab faculty.
10. Perform the necessary steps to delete the user ID and the groups created in the lab session.

Text Book :

- IBM Team, z/OS Security Server RACF Command Language Reference, IBM, September 2006.

References :

- IBM Team, z/OS Security Server RACF Auditor's Guide, IBM, September 2006.

Web Services : www.redbooks.ibm.com

COMPUTER LAB V - MAINFRAME NETWORKING

1. Prepare assignment to Customize TCP/IP profile
2. Prepare assignment to Customize VTAM Library
3. Prepare the components of SNA
4. Case study on Sysplex components
5. Basic DB2 operation
6. Basic CICS operation
7. Case study of MVS abends
8. Case study of DB2 Abends
9. Case study of CICS abends
10. Basic Operation of Mainframe server

Text Book :

- Paul Rogers, Paola Bari, Luiz Fadel, Andreas Horn, Redelf Janssen, Valeria Sokal, Thomas Stoeckel, ABC's of z/OS System Programming Volume 5, International Technical Support Organization, December 2005.
- Lydia Parziale, David T. Britt, Chuck Davis, Jason Forrester, Wei Liu, Carolyn Mathews, Nicolas Roasselot, TCP/IP Tutorial and Technical Overview, International Technical Support Organization, December 2006.

References :

- IBM Team, z/OS Communications Server IP Configuration Guide, IBM, April 2006.
- Craig S. Mullins, DB2 Developer's Guide, Pearson Education, 2004.
- Stephen Hochstetler, JunHeum Min, Matt Robbins, Nancy Milliner, Narend Chand, Syamsul Hidayat, HMC Handbook, International Technical Support Organization, July 2007.
- Bill White, Marian Gasparovic, Dick Jorna, System z Connectivity Handbook, International Technical Support Organization, July 2007.
- Bill White, Yukihiko Miyamoto, Gilson Cesar de Oliveira, Roland Peschke, Communication Server for z/OS TCP/IP Implementation Volume 1, International Technical Support Organization, December 2006.

Web Services : www.redbooks.ibm.com

OPTION (C) – IBM MAINFRAME DATABASE ADMINISTRATION

PAPER IV - MAINFRAME DATABASE DESIGN

Prerequisite : Mainframe Data Organization

UNIT-I : Database and System Objects Overview

DB2 Catalog and Directory – Database Objects – Tables, Indexes, Table-spaces, Views, Databases and Storage Groups – System Objects – DB2 CATALOG, DB2 DIRECTORY, Active and Archive log, BSDS, LOCKS – Buffer pools.

UNIT-II : Basics of Relational Database Management System

Normalization concepts with various normal forms – DDL (including all major database objects) – DML and DCL (including Joins, Sub-queries, Unions) – Referential Integrity Concepts.

UNIT-III : Fundamentals of Program Preparation

Using SQL in an application program, cursors etc – Program Preparation – Pre-compilation, Bind – Application concepts – commit rollback – concepts of Isolation levels.

UNIT-IV : Locking and Concurrency

Locking and Concurrency – Types of Lock – Locks and Latches – Claims and Drains – Locking issues and lock avoidance.

UNIT-V : Performance Monitoring and Tuning

Access Paths and Optimizer – Using Explain – CREATE_PLAN TABLE – PLAN_TABLE Description – Populating and Maintaining a PLAN_TABLE – Evaluating a PLAN_TABLE data – Estimating SQL statement cost – Understanding cost categories.

Text Book :

- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.

References :

- DB2 Application Programming and SQL Guide, IBM, August 2001 (softcopy only).
- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.
- DB2 UDB v8.1 Certification Exam 700, Roger E. Sanders, Prentice Hall, 2003.

Web Services : www.ibmmainframes.com

PAPER V - MAINFRAME DATABASE FOR SYSTEM SUPPORT

Prerequisite : Mainframe Database Design

UNIT-I : Basics of Database (DB2) Address Spaces

System Services Address Spaces (SSAS), Database Services Address Space (DSAS), Internal Resource Lock Manager (IRLM), Distributed Database Facility (DDF), Stored Procedure Address Space (SPAS).

UNIT-II : Basics of Database (DB2) Objects – System Objects

DB2 Catalog – DB2 Directory – Active Log – Archive Log – BSDS – Buffer Pool.

UNIT-III : Database (DB2) Online Utilities

REORG, RUNSTAT, CHECK DATA & INDEX, REPORT, STOSPACE, UNLOAD, REPAIR, COPY, RECOER, QUIESCE, MODIFY and LOAD.

UNIT-IV : Basics of Database (DB2) Standalone Utilities

DSN1COPY – DSN1LOGP – DSN1PRNT – DSNJLOGF – DSNJU003 – DSNJU004.

UNIT-V : Database (DB2) and Other Environment Connectivity

DB2 with CICS – DB2 with IMS – DB2 with TSO – DB2 connect.

Text Book :

- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.

References :

- DB2 Administration Guide : Implementation IBM Team, IBM Publications, 2002.
- DB2 Administration Guide : Performance IBM Team, IBM Publications, 2002.
- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.
- DB2 UDB v8.1 Certification Exam 700, Roger E. Sanders, Prentice Hall, 2003.

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PAPER VI - MAINFRAME DATABASE ADMINISTRATION

Prerequisite : Mainframe Database for System Support

UNIT-I : Basics of Database (DB2) Operations

Starting / Stopping DB2 Subsystem – Entering Commands To DB2 – DSN commands – Monitoring DB2 Subsystem.

UNIT-II : Database (DB2) System Objects & Restart Facilities

DB2 system objects – Active and archive log maintenance – Log and Bootstrap Data Set – Backup and recovery of system object – Case Examples of DB2 Failures – Disaster recovery planning.

UNIT-III : Database (DB2) Security

Explicit Privileges – Database Privileges – System Privileges – User Privileges – Schema Privileges – Grant & Revoke Privileges.

UNIT-IV : Database (DB2) Optimization

Performance Management definition – Performance – data flows and bottlenecks – Monitoring Tools Optimizer – Performance Tuning – Explain Function Plan-Table – Overview of DB2 Governor (RLST) Index Screening – Non-Matching Index Scan – In-List Index Scan & Multiple Index Access.

UNIT-V : Database (DB2) Installation & Configuration

DB2 Installation and Planning – Storage Estimates – Virtual and Real Storage – DASD Requirements – SMP/E Installation jobs.

Text Book :

- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.

References :

- DB2 Administration Guide : Implementation IBM Team, IBM Publications, 2002.
- DB2 Administration Guide : Performance, IBM Team, IBM Publications, 2002.
- DB2 UDB v8.1 Certification Exam 700, Roger E. Sanders, Prentice Hall, 2003.

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COMPUTER LAB III - MAINFRAME DATABASE DESIGN

Prerequisite : Mainframe Database Design Theory

1. Create tables and define table check constraints.
2. Create different types of indexes.
3. Creating referential structures – Define primary foreign keys.
4. Examples of SELECT, INSERT, UPDATE, and DELETE Statements are processed.
5. Write Joins, sub-queries and interpret your result, how DB2 is evaluating these type of queries behind the Screen.
6. Analyze and interpret the main steps needed to prepare a program that access with the embedded static SQL.
7. Analyze some simple program to insert, update, delete and read the data from/to the database with cursor.
8. Analyze the binding parameters and interpret your results.
9. The participants become familiar with how locking is implemented with in DB2 (purpose of S and X locks, isolation level, Maximum lock size, Lock avoidance etc.).
10. Obtaining access path information. Create a plan table and obtain access path information using EXPLAIN Query the information placed in the PLAN TABLE.

COMPUTER LAB IV - MAINFRAME DATABASE FOR SYSTEM SUPPORT

Prerequisite : Mainframe Database for System Support Theory

1. Creating database.
2. Creating table spaces.
3. Create Table, Index and View.
4. Analyze and interpret your result how DB2 utilities may be executed, monitored, terminated, and restarted.
5. Run the DB2 LOAD/Unload utility.
6. Run the CHECK DATA utility to check DB2 table space.
7. Run the COPY utility and the RECOVER utility.
8. Run QUIESCE and MODIFY data and statistics.
9. Run Stand alone utilities.
10. Analyze CICS and DB2 connectivity.

COMPUTER LAB V - MAINFRAME DATABASE ADMINISTRATION

Prerequisite : Mainframe Database Administration Theory

1. Start and Stop database.
2. Experiment DB2 privileges and authorities.
3. Prepare an assignment on implementing security for plans and packages.
4. Analyze DB2 Installation steps.
5. Run Recovery Utilities.
6. Case study on Disaster Recovery.
7. Taking backup old DB2 system datasets.
8. Identify how DB2 works so that you can begin to monitor and tune DB2.
9. Analyze DB2 traces for both continuous monitoring and for problem analysis.
10. Prepare an assignment on when to start with statistics or with accounting reports, depending on the situation.

Text Book :

- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.

References :

- DB2 Administration Guide : Implementation IBM Team, IBM Publications, 2002.
- DB2 Administration Guide : Performance, IBM Team, IBM Publications, 2002.
- DB2 Developer's Guide, Craig S. Mullins, Pearson Education, 2004.
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