OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/ /026-A **07th August, 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Management

The Board of Studies for the Department of Management is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) S.P. Mathur, Dean, Faculty of Management and Commerce - Chairman
2. Prof. (Dr.) Lalit Pipliwal, JRN Vidhya Peeth University,Udaipur - External Member
3. Mr. Umesh Toshniwal- GM-Marketing, Nitin Spinners Ltd, Bhilwara - External Member
4. Mr. Raj Singh, Assistant Professor - Internal Member
5. Mr. Nishant Dublish,Assistant Professor -Internal Member
6. Mr. Shivam Somani, Cashier, ICICI Bank, Bhilwara - Alumni
7. Mr. Rajesh Bhatt, Head & Assistant Professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the last week of August 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY
DEPARTMENT OF MANAGEMENT
Minutes of the Board of Studies (BOS)

The Meeting of the Board of Studies (BOS) of the Faculty of Management and Commerce, Department of Management was held on 25th August 2018 in Room No. 333 at 11:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2018-19.

CONTENTS

Item 1.1 Grant of Leave of Absence, if any

All the members and one external member were present at the time of the Meeting, Therefore absentee was marked.

Item 1.2 Welcoming the New Members:

The Chairperson Prof. (Dr.) S.P. Mathur welcomed the Members for attending the meeting of the Board of Studies. The Chairperson further expressed special thanks to Dr. Lalit Kumar Pipliwal, Associate Professor, Faculty of Management Studies, Janardhan Rao Nagar Deemed to be University, Udaipur (Rajasthan), for sparing the time from their busy schedule to attend the meeting.

Dr. S.P. Mathur, Chairperson briefed the meeting in front of members of BOS. The list of members is mentioned in Annexure I.

Rajesh Bhatt, Assistant Professor & Head-Department of Management, formally welcomed all the members of the Board of Studies and thereafter the Agenda items are discussed and resolved as follows:

MEWAR UNIVERSITY * Chittorgarh - 312901 (Raj.) *

Item No.1.3: To confirm the minutes of the Meeting of BOS held on 24-04-2017, The Board considered and confirmed the minutes of its previous meeting held on 24th April 2017

Item No. 1.4: Follow-up actions on the Minutes of the previous meeting dated 24-04-2017

The Board members noted the action taken, where necessary, on the various decisions taken in its meeting held on 24-04-2017 The Board also expressed its satisfaction with the action taken report on the various decisions taken in its meeting held on 24th April 2017.

1.5 Propose to review course structure and syllabus for New Courses:

- The Committee reviewed and approved all the contents of the syllabus and their nomenclature have been duly studied and approved by the members of BOS. The syllabus of the BBA on choice-based credit system (CBCS) pattern has been implemented vide the approval of the board of studies which was held 24th April 2017. The syllabus of the MBA on CBCS pattern has been implemented vide the approval of the board of studies which was held 24th April 2017.
- It was agreed to replace the course "Comprehensive Viva-Voce" with "Entrepreneurship Development" in BBA IIIrd Semester, the course "Comprehensive Viva-Voce" with "Corporate Accounting" in BBA IVth Semester, the course "Comprehensive Viva-Voce" with "Banking & Insurance" in BBA Vth Semester for the upcoming session from 2018-19.
- The BOS committee Members agreed to introduce one new course for BBA students in semester 4th from the upcoming session 2018-19. The courses are mentioned below. **(Annexure 2)**

  1. Environmental Management

- The BOS committee Members agreed to introduce two new courses for MBA students in the semester 2nd from the upcoming session 2018-19. The courses are mentioned below. **(Annexure 3)**

  1. Sales & Distribution Management
  2. Business Finance

1.6 Any recommendations & Suggestions from Members to make changes, if necessary

- To make the course more relevant and do necessary changes and up gradation of all the courses/training programs proposed by the academic members of the BOS.
- In addition, BOS will also explore the possibility of conducting new courses according to the requirement of the corporate world.
- To offer suggestions for identifying areas for the conduction of workshops/seminars etc. in the coming session.

1.7 Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

Annexure I

MEWAR UNIVERSITY

DEPARTMENT OF MANAGEMENT

Date of the meeting: 28-08-2018

Venue: Room No: - 333

Members present:-

SN	Name	Designation	Post	Signature
1	Dr. S.P. Mathur	Professor	Chairman	28/08/18
2	Rajesh Bhatt	Assistant Professor& HOD	Convener	28/8/18
3	Dr Lalit Kumar Pipliwal	Associate Professor, Dr Janardhan Rao Nagar (Deemed to be University),Udaipur (Raj)	External Member	28/08/18
4	Mr. Umesh Toshniwal	VP-Marketing , Nitin Spinners Ltd., Bhilwara	External Member	28/8/18
5	Mr. Raj Singh	Assistant Professor	Internal Member	28/8/2018
6	Mr. Nishant Dublish	Assistant Professor	Internal Members	28/8/18
7	Mr. Shivam Somani	Cashier, ICICI Bank Ltd., Bhilwara.	Alumni	28/08/18

Environmental Management

Unit 1

Renewable & Non Renewable Resources – Use & over utilization, Deforestation and its effects on forest & tibia people, Water Resources:- Use & over utilization of surface & ground water, flood, drought dams, benefits & problem, Mineral Resources:- Use & explanation, Food Resources:- World food problem, change causes by agriculture & over grazing effects of modern agriculture fertilizer, pesticide problem, change caused by Agriculture & over gazing effects of modern Agriculture fertilizers, pesticide problem. Energy Resources:- Growing energy needs use Alternate energy source, Land Resource:- Land as resource, land degradation, landside, soil erosion & desertification. Ecosystem:- concepts, function, structure, food chain, food webs, in following ecosystem, Forest Ecosystem, Grass land, Desert Land, Aquatic land.

Unit 2

Biodiversity & its Conservation:- Introduction, definition genetic species & ecosystem diversity, biodiversity it global, national & local levels, India as a mega diversity nation, threats to Biodiversity, Conservation of Biodiversity, Environmental pollution :- Definition , Causes, effect & control measure of Air pollution, Water, soil & marine, noise, thermal, nuclear hazards, Role of and Individual in prevention of pollution, Disaster management, Flood Earthquake land, Slide, Cyclone.

Unit 3

Social Issues in Environment:- From unstable to sustainable Development urban Problem related to energy, Resettlement & Rehabilitation of people, Environment ethics , Consumerism, Environment Protection Act, Climate change, global warming, acid rain, ozone-layer depletion & nuclear accidents, Air Act, Waters Act, wild life protection Act, Issues involved in enforcement of environmental legislation for public Awareness, Human population & Environmental:- Population growth, variations among national, population explosion- family welfare program, Environmental & Human health, Human Right, HIV/AIDS women's & child welfare, Role of Information Technology in environment.

Reference:

Environment Management by N.K. Oberai
Ecology, Environment & Development by K.L. Narsimha Murthy
Air Pollution – Causes & Effective Control by R.K. Arora

Sales & Distribution Management

Unit 1

Sales Management – Meaning, Objectives, Sales executives as coordinators, sales management and control, personal selling, different types of personal selling situation, personal selling process, sales forecasting.

Sales Force Management – Organization, sales force planning, profiling, recruiting, training, motivation and compensation.

Unit 2

Sales Administration & Control – Sales Analysis, Sales quotas, sales budget, sales territory average, sales audit.

Physical Distribution - Nature and scope of physical distribution, order processing, distribution strategies, warehousing and transportation – types and selection.

Unit 3

Channel Design Management – needs and importance of intermediaries, function of channel members, establishing channel objectives and constraints, identifying and evaluating major channel members, channel conflicts and their resolutions.

Reference:

Sales Management by Rechard R Still & Cundiff.

Business Finance

Unit 1

Working Capital Management – Meaning, nature and need for working capital, operating cycles, optimum level of working capital, factors determining working capital level, Computation of working capital level, estimation of current assets and liabilities.

Management of cash – Objectives of holding cash, process of cash management

Receivable management – Objectives and considerations for an optimum credit policy.

Unit 2

Inventory Management – Objectives and techniques of inventory valuation, LIFO, FIFO, economic order quality, (EOQ), sales inventory control (ABC Analysis), Capital Budgeting – meaning, nature and significance of capital budgeting decision, importing evaluation techniques – discounted cash flow techniques profitability Index (PI) net present value (NPV), and internal rate of return (IRR), non discounted cash flow techniques – pay back (PB) method. Average rate of return (ARR)

Unit 3

Dividend Policy – determinants of dividend policy, bonus shares stock split – concept and implication, dividend and valuation – MM hypothesis and Walter's Model, SEBI

Stock Exchange – Constituents, role and functions of board in primary and secondary capital market of India, Stock Exchange – significance, structure and functional listing of securities and methods of trading in stock – exchange.

Reference:

Financial Management by I.M. Pandey
Financial Management by Khan and Jain
Financial Management by Prashant Chandra

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018-19/0061-A **16th January 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of law

The Board of Studies for the Department of Law is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) P.S. Varshney, Dean, Faculty of Legal Studies - Chairman
2) Dr. Kala Munat, Assistant Professor, MLSU, Udaipur - External Member
3) Dr. Raj Shree Choudhary, Assistant Professor, MLSU, Udaipur - External Member
4) Dr. Vikas Trivedi, Assistant Professor, Nirma University, Gujarat - Internal Member
5) Ms. Preeti Sanger, Assistant Professor - Internal Member
6) Mr. Amit Kumar, Assistant Professor - Internal Member
7) Mr. Amit Yadav, Assistant Professor, - Internal Member
8) Ms. Asha Rawat, HOD/Assistant Professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the fourth week of January 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

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- PS to Hon'ble President (for kind information)
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- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF LAW

27th January 2018

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Law was held on 27th January 2018 in Room No. 135 at 11:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) P.S. Varshney, Dean, Faculty of Legal Studies - Chairman
2) Dr. Kala Munat, Assistant Professor, MLSU, Udaipur - External Member
3) Dr. Raj Shree Choudhary, Assistant Professor, MLSU, Udaipur - External Member
4) Dr. Vikas Trivedi, Assistant Professor, Nirma University, Gujarat - Internal Member
5) Ms. Preeti Sanger, Assistant Professor - Internal Member
6) Mr. Amit Kumar, Assistant Professor - Internal Member
7) Mr. Amit Yadav, Assistant Professor - Internal Member
8) Ms. Asha Rawat, HOD/Assistant Professor - Convener

Ms. Asha Rawat, (Head, Department of Law) warmly welcomed all the board members. The head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 19-01-2017

Resolution: Minutes of the previous BOS of the Law department held on 19-01-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Ms. Asha Rawat (Head, Department of Law) presented departmental proposed activity that should be conducted related to curricular development, research development, and faculty development of Law.

27/1/18

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

Agenda 3: Review and approval of Existing Programmes/Courses

Resolution: Ms. Asha Rawat (Head, Department of Law) presented the ongoing syllabus of B.A LL.B (Hons.), BBA LL.B (Hons.), LL.B and LL.M. The BOS committee reviewed and approved the scheme and syllabus in the upcoming session 2018-19 **(Annexure 2)**

Agenda 4: To recommend the approved syllabus to Academic Council

Resolution: Members of the Board of Studies approved the reviewed syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

27/1/18

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF LAW

27th January, 2018

Annexure 1: Attendance Sheet

Following members were present in the Board of Studies meeting:

S.NO.	NAME OF MEMBERS		SIGNATURE
1.	Prof. (Dr.) P.S VARSHNEY	CHAIRMAN	
2.	Dr. Kala Munat, Assistant Professor, MLSU, Udaipur	External Member	
3.	Dr. Raj Shree Choudhary, Assistant Professor, MLSU, Udaipur	External Member	
4.	Mr. Amit Yadav Assistant Professor	MEMBER	
5.	Dr. Vikas Trivedi, Assistant Professor, Nirma University, Gujarat	Member	
6.	Ms. Preeti Sanger Assistant Professor	MEMBER	
7.	Mr. Amit Kumar Assistant Professor	MEMBER	
8.	Ms. Asha Rawat	CONVENOR	

Annexure 1: Attendance Sheet

Prof. (Dr.) P.S. VARSHNEY

Chairman

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/ 276-A **08th March 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for the Department of Chemical Engineering

The Board of Studies for the Department of Chemical Engineering is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) Tanveer Ahmed Kazi, Dean, Engineering - Chairman
2) Prof. (Dr.) Mr. Mahesh Kumar Singla- Senior Engineer, Hindustan Zinc - External Member
3) Prof. (Dr.) Pankaj Kumar Pandey-Amity University Jaipur - External Member
4) Mr. Dinesh Kumar, Assistant Professor - Internal Member
5) Mr. Faizan Khoker, Assistant Professor - Internal Member
6) Ms. Shalinee Gupta, Head & Assistant Professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the second week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

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- PS to Hon'ble Pro-President (for kind information)
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- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CHEMICAL ENGINEERING

DATE: 09.06.2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Chemical Engineering, Faculty of Engineering and Technology was held on 09th June 2018 in Room No. 135 at 10:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) Tanveer Ahmed Kazi, Dean, Engineering - Chairman
2) Prof. (Dr.) Mr. Mahesh Kumar Singla- Senior Engineer, Hindustan Zinc - External Member
3) Prof. (Dr.) Pankaj Kumar Pandey-Amity University Jaipur - External Member
4) Mr. Dinesh Kumar, Assistant Professor - Internal Member
5) Mr. Faizan Khoker, Assistant Professor - Internal Member
6) Ms. Shalinee Gupta, Head & Assistant Professor - Convener

Ms. Shalinee Gupta (Head, Chemical Engineering) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 06-06-2017

Resolution: Minutes of the previous BOS of the Chemical Engineering Department held on 06-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Ms. Shalinee Gupta presented departmental activities conducted related to curricular development, research development, faculty development and Industrial collaboration were presented.

Agenda 3: Review in any Programme/Course

Resolution: No changes were made to the approved scheme and syllabus of the course B. Tech. in Chemical Engineering.

Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CHEMICAL ENGINEERING

DATE: 09.06.2018

Annexure 1: Attendance Sheet

S.NO.	Name& Designation	Designation in BOS	Signature
1	Prof. (Dr.) Tanveer Ahmed Kazi, Dean, Engineering	Chairman	
2	Prof. (Dr.) Mr. Mahesh Kumar Singla	External Member	9/6/18
3	Prof. (Dr.) Pankaj Kumar Pandey	External Member	
4	Mr. Dinesh Kumar, Assistant Professor	Internal Member	09.06.2018
5	Mr. Faizan Khoker, Assistant Professor	Internal Member	
6	Ms. Shalinee Gupta, Head & Assistant Professor	Convener	

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/743-A **16-06-2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Pharmacy

The Board of Studies for the Department of Department of Pharmacy is reconstituted as per Rule12 of the Statutes of Mewar University, as under:

1) Dr. Kaushal Kishor Chandrul, Professor & Dean	Chairman
2) Dr. Rajesh Verma, Professor, Apex University, Jaipur	External Member 1
3) Dr. Vinesh Chaudhary, Professor, LBS College of Pharmacy, Jaipur	External Member 2
4) Mohammed Yusuf, Pharmacist	Alumni
5) Mr. Amit Khandelwal, Elocon Pharmaceutical Pvt Ltd, Jaipur	Member from Industry
6) Ms Neelam Somani, Assistant Professor	Internal Member 1
7) Mr Aziz Ahmed, Assistant Professor	Internal Member 2
8) Mr Pankaj Chasta, Assistant Professor	Internal Member 3
9) Mr. Gaurav Kumar Sharma, Assistant Professor & HOD	Convener

The terms of reference for the Board of Studies are as provided in Rule 12 or the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the third week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHARMACY

DATE: 16.06.2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Pharmacy, Faculty of Medical, Surgical and Paramedica was held on 16th June 2018 in Room No. 135 at 10:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2018-19. The following members were present: **(Annexure 1)**

1) Dr. Kaushal Kishor Chandrul, Professor & Dean	Chairman
2) Dr. Rajesh Verma, Professor, Apex University, Jaipur	External Member 1
3) Dr. Vinesh Chaudhary, Professor, LBS College of Pharmacy, Jaipur	External Member 2
4) Mohammed Yusuf, Pharmacist	Alumni
5) Mr. Amit Khandelwal, Elocon Pharmaceutical Pvt Ltd, Jaipur	Member from Industry
6) Ms Neelam Somani, Assistant Professor	Internal Member 1
7) Mr Aziz Ahmed, Assistant Professor	Internal Member 2
8) Mr Pankaj Chasta, Assistant Professor	Internal Member 3
9) Mr. Gaurav Kumar Sharma, Assistant Professor & HOD	Convener

Agenda 1: Grant of leave of absence member, if any
Resolution: No one was absent

Agenda 2: Welcoming the New Members
Resolution: Mr. Gaurav Kumar Sharma, Head of the Department of Pharmacy, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 3: Minutes of the previous Meeting of the Board of Studies of the Department of Pharmacy Mewar University
Resolution: Minutes of the previous BOS of the Pharmacy Department held on 10-06-2017 were discussed and approved.

Agenda 4: Revision in any program/course

PRINCIPAL
Department of Pharmacy
Mewar University
Gangrar, Chittorgarh

Resolution: No changes were made to PCI approved scheme and syllabus of the course B. Pharma and D Pharma. The Committee decided to continue them as mentioned by PCI rules and regulations.

Agenda 5: To introduce the value-added course

Resolution: Department of Pharmacy offers Training / Internships which are conducted every year. These sessions are conducted by experts and help students stand apart from the rest in the job market by adding further value to their resumes. They are mostly independent of each type of field. **(Annexure 2)**

S.No.	Name of the value-added courses/ Internships	Course Code	Year of offering	Duration of course/ Internships
1.	B. Pharm – Short-term training	BP	2017-18	01 Months
2.	D. Pharm - Short-term training	DPH	2017-18	03 Months

The main objectives of the Value Added Course are:

- To provide students with an understanding of the expectations of industry.
- To improve the employability skills of students.
- To bridge the skill gaps and make students industry ready.
- To provide an opportunity for students to develop interdisciplinary skills.
- To mold students as job providers rather than job seekers.

Guidelines for conducting value-added courses/Internship:-

The training/internship is conducted in collaboration with well-known pharmaceutical industries like **Oniosome and CTSD (Center for Training & skill development), Mohali.**

The B. Pharma and D. Pharma students will be sent to this internship at the end of the final semesters.

Duration:-

The duration of training/internship is 1 month/150 hours for B. Pharma in the pharmaceutical industry and 3 months/500 hours in the hospital as per mentioned by the Pharmacy Council of India (PCI).

PRINCIPAL
Department of Pharmacy
Mewar University
Gangrar, Chittorgarh

Agenda 6: Any other suggestion

Resolution: Prof. (Dr.) Kaushal Kishor Chandrul, Chairperson briefed the committee regarding the application to start B. Pharma Practice to the Pharmacy Council of India (PCI) has been submitted.

Agenda 7: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was concluded with a gentle thanks by the Chairperson Prof. (Dr.) Kaushal Kishor Chandrul, Department of Pharmacy.

PRINCIPAL
Department of Pharmacy
Mewar University
Gangrar, Chittorgarh

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHARMACY

DATE: 16.06.2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Dr. Kaushal Kishor Chandrul, Professor & Dean	Chairman	
2	Dr. Rajesh Verma, Professor, Apex University, Jaipur	External Member 1	
3	Dr. Vinesh Chaudhary, Professor, LBS College of Pharmacy, Jaipur	External Member 2	
4	Mohammed Yusuf, Pharmacist	Alumni	
5	Mr. Amit Khandelwal, Elocon Pharmaceutical Pvt Ltd, Jaipur	Member from Industry	
6	Ms Neelam Somani, Assistant Professor	Internal Member 1	
7	Mr Aziz Ahmed, Assistant Professor	Internal Member 2	
8	Mr Pankaj Chasta, Assistant Professor	Internal Member 3	
9	Mr. Gaurav Kumar Sharma, Assistant Professor & HOD	Convener	

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/545-A **8th May 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Electronics and Communication Engineering

The Board of Studies for the Department of Electronics and Communication Engineeringis reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) Tanveer Ahmed Kazi, Dean of Engineering - Chairman
2) Prof. (Dr.) Archana Agarwal - External Member
3) Mr. JitendraVaswani, Assistant Professor - Internal Member
4) Mr. Sayed Arif Ali, Assistant Professor - Internal Member
5) Mr. Gaurav Sharma, Head & Assistant Professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.
The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.
The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman on the 15th June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.
The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

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- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DATE: 15/06/2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Electronics and Communication Engineering meeting held on 15-06-2018 at 11.30 AM.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) Tanveer Ahmed Kazi, Dean of Engineering - Chairman
2) Prof. (Dr.) Archana Agarwal - External Member
3) Mr. JitendraVaswani, Assistant Professor - Internal Member
4) Mr. Sayed Arif Ali, Assistant Professor - Internal Member
5) Mr. Gaurav Sharma, Head & Assistant Professor - Convener

Mr. Gaurav Sharma, Head, Electronics & Communication Engineering, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Scheme and Syllabus of all the courses which includes B.Tech and M.Tech.(DC) was reviewed by external experts and members of the BOS. Some suggestions have been given by the experts in different areas of the course curriculum which are as follows:

Agenda 1: To approve minutes of the previous BOS, held on 15-06-2017

Resolution: Minutes of the previous BOS of the Electronics & Communication Engineering department held on 15-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. Gaurav Sharma,(Head, Electronics & Communication Engineering) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development, and Industrial collaboration.

Agenda 3: Review of Existing Programmes/ Courses

Resolution: The Committee reviewed the scheme and syllabus of the B. Tech (ECE) and M. Tech (DC) programme and approved the scheme and syllabus for the session 2018-19.**(Annexure 2)**

15/6/2018

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

Agenda 4: Introduction of New Programme/Course

Resolution:

1. The BOS Committee approved the syllabus of two new courses in M. Tech. (Digital Communication)for PG students from session 2018-19are mentioned below. **(Annexure 3)**

- High-Frequency Electronics
- Optimization Techniques

2. The BOS Committee members also approved the syllabus of four new courses in B. Tech. (Electronics & Communication Engineering) for UG studentsfrom session 2018-19are mentioned below. **(Annexure 4)**

- Linear IC applications
- Electromaghetic theory
- Speech and Audio Processing
- Adaptive Signal Processing

Agenda 5: Any other suggestions by BOS Committee

Resolution: Suggestion regarding subject scheme and syllabus-

1. The importance and possibilities of departmental research activities were discussed and suggestions were given for the up-gradation of the syllabus.
2. In the future, the courses and programs should be designed and developed according to today's demand so that it will be a good opportunity to attract students and industries also.
3. New programs should be introduced e.g. PG Diploma in IoT and B.Sc. in Electronic Science as per the industrial requirement for the next session 2019-2020.

Agenda 6:To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

15/6/2018

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DATE: 15/06/2018

Annexure 1: Attendance Sheet

S.NO.	Name& Designation	Designation in BOS	Signature
1	Prof. (Dr.)Tanveer Ahmed Kazi, Dean Engg.	Chairman	15/6/2018
2	Prof (Dr.) ArchanaAgarwal	External Member	15/6/2018
3	Mr. JitendraVaswani, Assistant Professor, Electronics & Comm. Engg.	Internal Member	15/6/18
4	Mr. SayedArif Ali, Assistant Professor, Electronics & Comm. Engg.	Internal Member	Syed 15/6/2018
5	Mr. Gaurav Sharma, Head, Electronics & Comm. Engg.	Convener	Gaurav 15/6/18

Suggestions by External Expert 1

Suggestions by External Expert 2

HIGH FREQUENCY ELECTRONICS

Analysis of planar transmission lines: Variational method. losses in microstrip lines, analysis & design ofdevices; passive circuits, impedance transformers, couplers, power dividers, filters, oscillators, mixers, switches, amplifiers (narrow band /broad band) oscillators, active & passive phase shifters.

Microstrip lines on ferrite and garnet substrate; Isolators and circulators; lumped elements in MICs Analysis of basic transmission lines for millimeter wave frequencies. Integrated finline, image guide and its variants, non-radiative guide, H-guide and groove guide. Millimetre wave devices for generation and detection. Transitions, bends and discontinuities. Monolithic circuit components planar transmission lines, lumped and distributed passive elements.

BOOKS

High Frequency and Microwave Engineering - Ed Da Silva
High Frequency Techniques - Joseph F White.

OPTIMIZATION TECHNIQUES

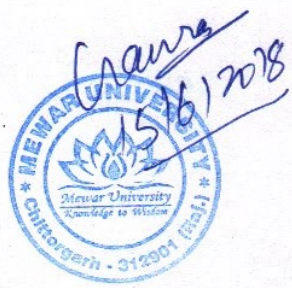
Introduction: Historical development, application to engineering problems, statement of optimization, classification of optimization, examples of optimization problems.
Linear Programming: Graphical method, simplex method, revised simplex method, Big-M method, 2- phase method, alternate optimal solutions, unbounded LPs, degeneracy and convergence, duality in linear programming, sensitivity analysis, dual simplex method, Transportation, assignment and other applications.
Non-Linear Programming: Unconstrained optimization techniques, direct search methods (Fibannoci method, golden section, quadrature and cubic interpolation) descent methods, constrained optimization, direct and indirect methods, optimization with calculm, kuhn-tucker conditions. Dynamic Programming: Multistage decision process, principles of optimality, computational procedures in dynamic programming.

BOOKS

- Hiller and Lieberman, Introduction to Operation Research (Seventh Edition) Tata McGrawHill Publishing Company Ltd
- Ravindren Philips and Solberg, Operation Research Principles and Practice (Second Edition) John Wiley & Sons.

Linear IC applications (Syllabus)

UNIT-I	DifferentialAndCascadeAmplifier:Balanced,Unbalancedoutputdifferentialamplifiers, FET differential amplifier, Current mirrors, Level Translators, Cascadeconfiguration of amplifiers, Operational amplifiers, Introduction to ideal OP-AMP,Characteristicparameters,Interpretationofdatasheets,PracticalOP-AMP,Itsequivalentcircuitand op-amp circuitconfigurations.
UNIT-II	OP-AMPWithNegativesFeedbackAndFrequencyResponse:Blockdiagramrepresentationoffeedbackamplifier,Voltageseriesfeedback,Voltageshuntfeedbackdifferentialamplifiers,Frequencyresponsecompensatingnetwork,Frequency response of internally compensative op-amp and non compensating op-amp. High frequency op-amp equivalent circuit, Open loop gain Vs frequency, Closedloopfrequencyresponse,Circuitstability,Slowrate.
UNIT-III	OP-AMPApplication:DC,ACamplifiers,Peakingamplifier,Summing,Sealing,Averaging and instrumentation amplifier, Differential input output amplifier, Voltageto current converter, Current to voltage converter, Very high input impedance circuit,Integrationanddifferentialcircuit,Waveshapingcircuit,Activefilters,Oscillators
UNIT-IV	SpecializedLinearICApplications:Universalactivefilter,Switchedcapacitorfilter,555timer,PLL,Poweramplifier,8038IC,ICsusedinradioreceiver.



Electromagnetic theory (Syllabus)

UNIT-I	Electric Field: Introduction, Orthogonal co-ordinate systems, Divergence theorem,Stoke"s theorem. Coulomb"s law, Electric field intensity, Electric fields due to pointcharge, Line charge, Surface charge and volume charge distributions, Electric fluxdensity,Gauss"slawanditsapplications,Electricpotential,Potential gradient,PoissonandLaplaceequations,Dipoleanddipolemoment.Capacitors,Capacitanceof systemconductors,Electricpotential energy associatedwithdifferentchargedistribution,Energydensity.
UNIT-II	Magnetic Field: Concepts, Vector magnetic potential, Force on a current element,Biotsavart"s law and applications, Magnetic flux density and magnetic field intensity,Force between current carrying conductors, Torque on closed conductors, Ampere"slawandmodifiedAmpere"slaw,Helmholtz"stheorem.
UNIT-III	ElectromagneticInduction:Faraday"slawofelectromagneticinduction–Inductanceof solenoids, Toroids, Transmission lines and cables, Mutual inductance, Inductors inseries and parallel circuits, Energy stored in magnetic fields andenergy density,Force and torque on closed circuits .Boundary conditions at the surface of dielectric,Conductorandmagnetic.
UNIT-IV	EM Waves and Wave Equations: Maxwell"s equation in point and integral form-Poynting"s theorem, Energy in electromagnetic field, Electromagnetic wave equation,Waveequationforfree space andconducting medium. Electromagnetic Waves: Uniform plane wave, Characteristics impedance or intrinsicimpedance, Wave propagationin alossless medium, Conductingmedium,Gooddielectric, Good conductor, Phase velocity and group velocity, Depth of penetration,Polarization,Linearpolarization,Circularpolarizationandelliticalpolarization,Reflectionand refractionofplanewaves,Surface waves.

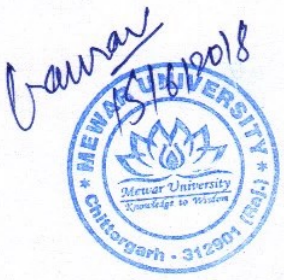
Speech and Audio Processing (Syllabus)

Unit 1.Introduction- Speech production and modeling - Human Auditory System;General structure of
speech coders; Classification of speech coding techniques – parametric, waveform and hybrid ; Requirements of speech codecs –quality, coding delays, robustness.

Unit2- Speech Signal Processing- Pitch-period estimation, all-pole and all-zero filters,convolution; Power spectral density, periodogram, autoregressive model, autocorrelation estimation.

Unit3- Linear Prediction of Speech- Basic concepts of linear prediction; LinearPrediction Analysis of
non-stationary signals –prediction gain, examples; Levinson-Durbin algorithm; Long term and short-term linear prediction models; Moving average prediction.

Unit4- Speech Quantization- Scalar quantization–uniform quantizer, optimum quantizer,logarithmic
quantizer, adaptive quantizer, differential quantizers; Vector quantization – distortion measures, codebook design, codebook types.



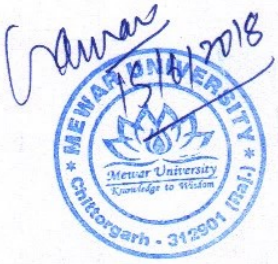
Adaptive Signal Processing (Syllabus)

Unit1- General concept of adaptive filtering and estimation, applications and motivation, Review of
probability, random variables and stationary random processes, Correlation structures, properties
of correlation matrices.

Unit2- Optimal FIR (Wiener) filter, Method of steepest descent, extension to complexvalued The LMS
algorithm (real, complex), convergence analysis, weight errorcorrelation matrix, excess mean quare error and mis-adjustment .

Unit3- Variants of the LMS algorithm: the sign LMS family, normalized LMSalgorithm, block LMS
and FFT based realization, frequency domain adaptive filters, Sub-band adaptive filtering. Signal space concepts - introduction to finite dimensional vectorspace theory, subspace, basis, dimension, linear operators, rank and nullity, inner product space, orthogonality, Gram Schmidt orthogonalization, concepts of orthogonal projection,orthogonal decomposition of vector spaces.

Unit4- Vector space of random variables, correlation as inner product, forward andbackward projections, Stochastic lattice filters, recursive updating of forward and backward prediction errors, relationship with AR modeling, joint process estimator, gradient adaptive lattice.



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/508-A **26th April 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Computer Applications

The Board of Studies for the Department of Computer Applications reconstituted as per Rule12 of the Statutes of Mewar University, as under:

1) Dr. Tanveer Ahmad Kazi, Dean, Faculty of Computer Science & System Studies - Chairman

2) Dr. Dilendra Hiran, Director, Pacific College of Computer Application Pacific University, Udaipur, Rajasthan - External Member

3) Mr. Anuj Kumar, Technical Leader, North Shore Tech., NOIDA - External Member

4) Mr. M. Rashid, Assistant Professor - Internal Member

5) Mr. Shiv Kumar, Assistant Professor, CSE Department - Internal Member

6) Devi Singh Shekhawat, HR, Chhattisgarh - Alumni

7) Mr. RavindraVerma, Assistant Professor & Head - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.
The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.
The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman in the month of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.
The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoDs (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF COMPUTER APPLICATIONS

DATE: 12.06.2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Computer Application was held on 12th June 2018 in Room No. 135 at 11:00 am onwards to approve the new/changes in curriculum and syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1) Dr. Tanveer Ahmad Kazi, Dean, Faculty of Computer Science & System Studies - Chairman
2) Dr. Dilendra Hiran, Director, Pacific College of Computer Application Pacific University, Udaipur, Rajasthan - External Member
3) Mr. Anuj Kumar, Technical Leader, North Shore Tech., NOIDA - External Member
4) Mr. M. Rashid, Assistant Professor: - Internal Member
5) Mr. Shiv Kumar, Assistant Professor, CSE Department - Internal Member
6) Devi Singh Shekhawat, HR, Chhattisgarh - Alumni
7) Mr. RavindraVerma, Assistant Professor & Head - Convener

Mr. Ravindra Verma (Head of the Department of Computer Application) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 17-06-2017

Resolution: Minutes of the previous BOS of the Computer Application Department held on 17-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. RavindraVerma (Head, Computer Applications) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development, and Industrial collaboration.

Agenda 3: Review of Existing Programmes/ Courses

Resolution:

- PGDCA course was running into a yearly scheme in previous year 2017-18, now it is proposed to start the PGDCA in semester scheme from session 2018-19. The Committee reviewed and

12/6/18

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

approved the scheme and syllabus of programme PGDCA for the upcoming session from 2018-19.**(Annexure 2)**

- The Committee reviewed and approved the scheme and syllabus of the practical classes in "Data Structure and Algorithms" MCA 2nd Semester. **(Annexure 3)**

Agenda 4: Any other suggestions by BOS Committee

Resolution:

1. Based on the suggestions received from the member of BOS committee, it has been decided to offer a course on "Computer Graphics", and "Cryptography and Network Security" to MCA Students in the next session.**(Annexure 4)**

Agenda 5: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

12/6/18

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF COMPUTER APPLICATIONS

DATE: 12.06.201

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Dr. Tanveer Ahmad Kazi, Computer Science & System Studies	Chairman	12.06.2018
2	Dr. Dilendra Hiran, Director, Pacific University, Udaipur, Rajasthan	External Member	12.6.2018
3	Mr. Anuj Kumar, Technical Leader, North Shore Tech., NOIDA	External Member	Anuj 12/06/18
4	Mr. M. Rashid, Assistant Professor, CSE Dept	Internal Member	
5	Mr. Shiv Kumar, Assistant Professor, CSE Dept	Internal Member	12/06/2018
6	Devi Singh Shekhawat, HR, Chhattisgarh	Alumni	Devi Singh 12/06
7	Mr. Ravindra Verma, Assistant Professor, CSE Dept	Convener	12/06/18
		Special Invitee (if any)	

COMPUTER GRAPHICS [MCS-305 A]

Total Credit: 4						Total Marks: 100
Teaching Scheme (per week in hours)			Evaluation Scheme			
Lecture	Tutorial	Pre-final Examination	Final Examination	Teacher Assessment		
				P	A	C/M
3	1	35	50	6	5	4

Syllabus

Unit No.	Unit Name	Course Contents	Lectures per unit
1	Introduction	Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices (p.nos 22-90 of text book-1)	8
2	Output primitives	Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms (p.nos 103-123,137-145,147-150,164-171 of text book- 1, p.nos. 72-99 of text book-2).	8
3	2-D geometrical transforms	Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems (p.nos 204-227 of text book-1).	8
4	2-D viewing	The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm (p.nos 237-249,257-261 of text book -1, p.nos. 111-126 of text book-2).	8
5	3-D object representation:	Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and BSpline surfaces. Basic illumination models, polygon-rendering methods. 3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.	8
		Total	40

Text/Reference Books:

- "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education
- "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
- "Computer Graphics", second Edition, Donald Hearn and M. Pauline Baker, PHI/Pearson Education.
- "Computer Graphics Second edition", Zhigandxiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw

CRYPTOGRAPHY AND NETWORK SECURITY [MCS-304 B]

Total Credit: 4 | **Total Marks: 100**

Teaching Scheme (per week in hours)		Evaluation Scheme				
Lecture	Tutorial	Pre-final Examination	Final Examination	Teacher Assessment		
				P	A	C/M
3	1	35	50	6	5	4

Syllabus

Unit No.	Unit Name	Course Contents	Lectures per unit
1	INTRODUCTION	OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality	8
2	PUBLIC KEY CRYPTOGRAPHY	Key Management - Diffie-Hellman key Exchange –Elliptic Curve Architecture and Cryptography - Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.	6
3	AUTHENTICATION AND HASH FUNCTION	Authentication requirements –Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm - Secure Hash Algorithm –RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard	10
4	NETWORK SECURITY	Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security – PGP – S/MIME - IP Security – Web Security	10
5	SYSTEM LEVEL SECURITY	Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems	6
		Total	**40**

Text/Reference Books:

- William Stallings, "Cryptography And Network Security – Principles and Practices", Prentice Hall of India, Third Edition, 2003.
- AtulKahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
- Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
- Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003.

OFFICE OF REGISTRAR

MEWAR UNIVERSITY, GANGRAR CHITTORGARH RAJ

Ref. No.: MU/RO/2018/ 419-A **13th April 2018**

OFFICE ORDERS

Sub: Reconstitution of Board of Studies for Departments of Electrical Engineering

The Board of studies for Department of Electrical Engineering is reconstituted as per rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) Tanveer Ahmed Kazi (Dean of Engineering)	-Chairman
2) Prof. (Dr.) Dinesh Birla, RTU, Kota	-External Member
3) Dr. Vinod Kumar Yadav, CTAE, Secure Meters Udaipur	-External Member
4) Mr. Shafik Ahmed, AGM, Secure Meters Udaipur	-External Member
5) Mr. Mantosh Kumar, Assistant Professor	-Member
6) Mr. Rajkiran B, Assistant Professor	-Member
7) Mr. Deepak Kumar Joshi	-Member
8) Mr. V. Siva Brahmaiah Rama (HOD,EE)	-Convener

The terms of reference for the Board of Studies are as provide in rule 12 of the Statutes.

The chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is that considered his/her association will contribute in the task of the meeting, with the approval of the President/ Vise Chancellor.

The Convener of the meeting is advised to hold the meeting of the BOS seeking Convenience of the Chairman before the end of August, 2018. The proceeding of the meeting may send to the VC/ Registrar as early as possible.

The External Member shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar

Registrar
Mewar University
Gangrar, (Chit' orgarh)

Copy To:

1) Ps To Hon'ble Chairperson for kind information
2) Secretary, MES & Member, BOM for kind information
3) To President for kind information
4) Ps To Pro President for kind information
5) Dean/HODs/COE/Research/Stores/it/etc

MEWAR UNIVERSITY (Raj.) Chittorgarh-312901

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF ELECTRICAL ENGINEERING

DATE: 22-08-2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Electrical Engineering meeting held on 22-08-2018 in Room No. 211 at 11.30 AM.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) Tanveer Ahmed Kazi (Dean of Engineering) -Chairman
2) Prof. (Dr.) Dinesh Birla, RTU, Kota -External Member
3) Dr. Vinod Kumar Yadav, CTAE, Secure Meters Udaipur -External Member
4) Mr. Shafik Ahmed, AGM, Secure Meters Udaipur -External Member
5) Mr. Mantosh Kumar, Assistant Professor -Member
6) Mr. Rajkiran B, Assistant Professor -Member
7) Mr. Deepak Kumar Joshi -Member
8) Mr. V. Siva Brahmaiah Rama (HOD, EE) -Convener

Mr. V. Siva Brahmaiah Rama, Head of the Department of Electrical Engineering, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 15-06-2017

Resolution: Minutes of the previous BOS of the Electrical Engineering Department held on 15-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. V. Siva Brahmaiah (Head, Electrical Engineering) presented a Departmental activity report mentioning all the activities conducted related to the curricular development such as the Lecture plan, Two Way Teaching Theory in the form of ACP, seminars, workshops, Guest Lecture, research and development, faculty development and industrial collaboration.

Agenda 3: Revision of Existing Programmes/ Courses

Resolution: The Committee reviewed the scheme and syllabus of B. Tech (Electrical Engineering) for the session 2018-19. **(Annexure 2)**

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

Agenda 4: Introduction of New Programmes/ Course

Resolution:

1. The BOS Committee approved the syllabus of five new courses in B. Tech. Electrical Engineering from session 2018-19 is mentioned below. **(Annexure 3)**
   - Computational Electromagnetics
   - Control Systems Design
   - Electrical Energy Conservation And Auditing
   - Advanced Electric Drives
   - Wind And Solar Energy Systems
2. Addition of a New Department Elective Course in M.Tech (Renewable Energy and Power System Engineering). **(Annexure 4)**

S.No.	Program Code	Course Name
1	M.Tech-RE	Optimum Utilization Of Heat And Power
2	M.Tech-PSE	Power System Harmonics
3	M.Tech-PSE	Planning and operation of Smart grid
4	M.Tech-PSE	Digital Communications
5	M.Tech-PSE	Dynamic Modelling And Control of Sustainable Energy Systems
6	M.Tech-PSE	Advanced Engineering Mathematics
7	M.Tech-PSE	Power System Instrumentation
8	M.Tech-PSE	Forecasting Techniques for Power System

Agenda 5: Any other suggestions by BOS Committee

Resolution: Further based on suggestions of Prof (Dr.) Dinesh Birla, Professor & Head of Department (RTU, Kota), Dr. Vinod Kumar Yadav, Associate Professor (CTAE, Udaipur) and Mr. Shafik Ahmed AGM, Secure Meter, Udaipur, it is decided to M.Tech Syllabus should be Revised and include electric Subjects is IOT/AI/Smart-grid/Electric Vehicle/ Present Scenario based on industry & one more suggestion given by the Expert started new Program in M.Tech with various specialization such Power Electronics & Drives, Modern Control System.

Agenda 6: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH

(RAJ.)DEPARTMENT OF ELECTRICAL ENGINEERING

DATE: 22-08-2018

Annexure I Attendance Sheet

SN	Name	Designation	Post	Signature
1	Prof.(Dr.) Tanveer Ahmed Kazi	Dean of Engineering & Technology	Chairman	
2	Prof. (Dr.) Dinesh Birla	Professor & Head of Department (RTU, Kota)	External Member	
3	Dr. Vinod Kumar Yadav	Associate Professor (CTAE, Udaipur)	External Member	
4	Mr. Shafik Ahmed	, AGM, Secure Meters Udaipur	External Member	
5	Mr. Mantosh Kumar	Dy. HOD, Assistant Professor	Internal Member	
6	Mr. Rajkiran B	Assistant Professor	Internal Member	
7	Mr. Deepak Kumar Joshi	Assistant Professor	Internal Member	
8	Dr. V. Siva Brahmaiah	Assistant Professor &HOD	Convener	

COMPUTATIONAL ELECTROMAGNETICS

Course Outcomes:

At the end of this course, students will demonstrate the ability to

- Understand the basic concepts of electromagnetics.
- Understand computational techniques for computing fields.
- Apply the techniques to simple real-life problems.

Module 1: Introduction

Conventional design methodology, Computer aided design aspects – Advantages. Review of basic fundamentals of Electrostatics and Electromagnetics. Development of Helmhotz equation, energy transformer vectors- Poynting and Slepian, magnetic Diffusion-transients and time-harmonic.

Module 2: Analytical Methods

Analytical methods of solving field equations, method of separation of variables, Roth's method, integral methods- Green's function, method of images.

Module 3: Finite Difference Method (FDM)

Finite Difference schemes, treatment of irregular boundaries, accuracy and stability of FD solutions, Finite-Difference Time-Domain (FDTD) method- Uniqueness and convergence.

Module 4: Finite Element Method (FEM)

Overview of FEM, Variational and Galerkin Methods, shape functions, lower and higher order elements, vector elements, 2D and 3D finite elements, efficient finite element computations.

Module 5: Special Topics

{Background of experimental methods-electrolytic tank, R-C network solution, Field plotting (graphical method)}, hybrid methods, coupled circuit - field computations, electromagnetic – thermal and electromagnetic - structural coupled computations, solution of equations, method of moments, Poisson's fields.

Module 6: Applications

Low frequency electrical devices, static / time-harmonic / transient problems in transformers, rotating machines, actuators. CAD packages.

Text/Reference Books

1. P. P. Silvester and R. L. Ferrari "Finite Element for Electrical Engineers", Cambridge University press, 1996.
2. M. N. O. Sadiku, "Numerical Techniques in Electromagnetics", CRC press, 2001.

Head
Department of
Electrical Engineering
Mewar University, Chittorgarh (Raj.)

CONTROL SYSTEMS DESIGN

Course Outcomes: At the end of this course, students will demonstrate the ability to

- Understand various design specifications.
- Design controllers to satisfy the desired design specifications using simple controller structures (P, PI, PID, compensators).
- Design controllers using the state-space approach.

Module 1: Design Specifications

Introduction to design problem and philosophy. Introduction to time domain and frequency domain design specification and its physical relevance. Effect of gain on transient and steady state response. Effect of addition of pole on system performance. Effect of addition of zero on system response.

Module 2: Design of Classical Control System in the time domain

Introduction to compensator. Design of Lag, lead lag-lead compensator in time domain. Feedback and Feed forward compensator design. Feedback compensation. Realization of compensators.

Module 3: Design of Classical Control System in frequency domain

Compensator design in frequency domain to improve steady state and transient response. Feedback and Feed forward compensator design using bode diagram.

Module 4: Design of PID controllers

Design of P, PI, PD and PID controllers in time domain and frequency domain for first, second and third order systems. Control loop with auxiliary feedback – Feed forward control.

Module 5: Control System Design in state space

Review of state space representation. Concept of controllability & observability, effect of pole zero cancellation on the controllability & observability of the system, pole placement design through state feedback. Ackerman's Formula for feedback gain design. Design of Observer. Reduced order observer. Separation Principle.

Module 6: Nonlinearities and its effect on system performance

Various types of non-linearities. Effect of various non-linearities on system performance. Singular points. Phase plot analysis.

Text and Reference Books :

1. N. Nise, "Control system Engineering", John Wiley, 2000.
2. I. J. Nagrath and M. Gopal, "Control system engineering", Wiley, 2000.
3. M. Gopal, "Digital Control Engineering", Wiley Eastern, 1988.
4. K. Ogata, "Modern Control Engineering", Prentice Hall, 2010.
5. B. C. Kuo, "Automatic Control system", Prentice Hall, 1995.
6. J. J. D'Azzo and C. H. Houpis, "Linear control system analysis and design (conventional and modern)", McGraw Hill, 1995.
7. R.T. Stefani and G.H. Hostetter, "Design of feedback Control Systems", Saunders College Pub, 1994.

Head
Department of Electrical Engineering
Mewar University, Chittorgarh (Raj.)

ELECTRICAL ENERGY CONSERVATION AND AUDITING

Module 1: Energy Scenario

Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance, restructuring of the energy supply sector, energy strategy for the future, air pollution, climate change. Energy Conservation Act-2001 and its features.

Module 2: Basics of Energy and its various forms

Electricity tariff, load management and maximum demand control, power factor improvement, selection & location of capacitors, Thermal Basics-fuels, thermal energy contents of fuel, temperature & pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity & heat transfer, units and conversion.

Module 3: Energy Management & Audit

Definition, energy audit, need, types of energy audit. Energy management (audit) approach understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel & energy substitution, energy audit instruments. Material and Energy balance: Facility as an energy system, methods for preparing process flow, material and energy balance diagrams.

Module 4: Energy Efficiency in Electrical Systems

Electrical system: Electricity billing, electrical load management and maximum demand control, power factor improvement and its benefit, selection and location of capacitors, performance assessment of PF capacitors, distribution and transformer losses. Electric motors: Types, losses in induction motors, motor efficiency, factors affecting motor performance, rewinding and motor replacement issues, energy saving opportunities with energy efficient motors.

Module 5: Energy Efficiency in Industrial Systems

Compressed Air System: Types of air compressors, compressor efficiency, efficient compressor operation, Compressed air system components, capacity assessment, leakage test, factors affecting the performance and savings opportunities in HVAC, Fans and blowers: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities.

Pumps and Pumping System: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities. Cooling Tower: Types and performance evaluation, efficient system operation, flow control strategies and energy saving opportunities, assessment of cooling towers.

Module 6: Energy Efficient Technologies in Electrical Systems

Maximum demand controllers, automatic power factor controllers, energy efficient motors, soft starters with energy saver, variable speed drives, energy efficient transformers, electronic ballast, occupancy sensors, energy efficient lighting controls, energy saving potential of each technology.

Text/Reference Books

1. Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-1, General Aspects (available online)
2. Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-3, Electrical Utilities (available online)
3. S. C. Tripathy, "Utilization of Electrical Energy and Conservation", McGraw Hill, 1991.

ADVANCED ELECTRIC DRIVES

Course Outcomes:

At the end of this course, students will demonstrate the ability to

- Understand the operation of power electronic converters and their control strategies.
- Understand the vector control strategies for ac motor drives
- Understand the implementation of the control strategies using digital signal processors.

Module 1: Power Converters for AC drives

PWM control of inverter, selected harmonic elimination, space vector modulation, current control of VSI, three level inverter, Different topologies, SVM for 3 level inverter, Diode rectifier with boost chopper, PWM converter as line side rectifier, current fed inverters with self-commutated devices. Control of CSI, H bridge as a 4-Q drive.

Module 2: Induction motor drives

Different transformations and reference frame theory, modeling of induction machines, voltage fed inverter control-v/f control, vector control, direct torque and flux control(DTC).

Module 3: Synchronous motor drives

Modeling of synchronous machines, open loop v/f control, vector control, direct torque control, CSI fed synchronous motor drives.

Module 4: Permanent magnet motor drives

Introduction to various PM motors, BLDC and PMSM drive configuration, comparison, block diagrams, Speed and torque control in BLDC and PMSM.

Module 5: Switched reluctance motor drives

Evolution of switched reluctance motors, various topologies for SRM drives, comparison, Closed loop speed and torque control of SRM.

Module 6: DSP based motion control

Use of DSPs in motion control, various DSPs available, realization of some basic blocks in DSP for implementation of DSP based motion control.

Text / References:

1. B. K. Bose, "Modern Power Electronics and AC Drives", Pearson Education, Asia, 2003.
2. P.C. Krause, O. Wasynczuk and S.D. Sudhoff, "Analysis of Electric Machinery and Drive Systems", John Wiley & Sons, 2013.
3. H. A. Taliyat and S. G. Campbell, "DSP based Electromechanical Motion Control", CRC press, 2003.
4. R. Krishnan, "Permanent Magnet Synchronous and Brushless DC motor Drives", CRC Press, 2009.

Head
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University, Chittorgarh (Raj.)

WIND AND SOLAR ENERGY SYSTEMS

Course Outcomes:

At the end of this course, students will demonstrate the ability to

- Understand the energy scenario and the consequent growth of the power generation from renewable energy sources.
- Understand the basic physics of wind and solar power generation.
- Understand the power electronic interfaces for wind and solar generation.
- Understand the issues related to the grid-integration of solar and wind energy systems.

Module 1: Physics of Wind Power:

History of wind power, Indian and Global statistics, Wind physics, Betz limit, Tip speed ratio, stall and pitch control, Wind speed statistics-probability distributions, Wind speed and power-cumulative distribution functions.

Module 2: Wind generator topologies:

Review of modern wind turbine technologies, Fixed and Variable speed wind turbines, Induction Generators, Doubly-Fed Induction Generators and their characteristics, Permanent-Magnet Synchronous Generators, Power electronics converters. Generator-Converter configurations, Converter Control.

Module 3: The Solar Resource:

Introduction, solar radiation spectra, solar geometry, Earth Sun angles, observer Sun angles, solar day length, Estimation of solar energy availability.

Module 4: Solar photovoltaic:

Technologies-Amorphous, monocrystalline, polycrystalline; V-I characteristics of a PV cell, PV module, array, Power Electronic Converters for Solar Systems, Maximum Power Point Tracking (MPPT) algorithms. Converter Control.

Module 5: Network Integration Issues:

Overview of grid code technical requirements. Fault ride-through for wind farms - real and reactive power regulation, voltage and frequency operating limits, solar PV and wind farm behavior during grid disturbances. Power quality issues. Power system interconnection experiences in the world. Hybrid and isolated operations of solar PV and wind systems.

Module 6: Solar thermal power generation:

Technologies, Parabolic trough, central receivers, parabolic dish, Fresnel, solar pond, elementary analysis.

Text / References:

1. T. Ackermann, "Wind Power in Power Systems", John Wiley and Sons Ltd., 2005.
2. G. M. Masters, "Renewable and Efficient Electric Power Systems", John Wiley and Sons, 2004..
3. S. P. Sukhatme, "Solar Energy: Principles of Thermal Collection and Storage", McGraw Hill, 1984.
4. H. Siegfried and R. Waddington, "Grid integration of wind energy conversion systems" John Wiley and Sons Ltd., 2006.
5. G. N. Tiwari and M. K. Ghosal, "Renewable Energy Applications", Narosa Publications, 2004.
6. J. A. Duffie and W. A. Beckman, "Solar Engineering of Thermal Processes", John Wiley & Sons, 1991.

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OPTIMUM UTILIZATION OF HEAT AND POWER

Unit I Basic concepts of CHP- The benefits and problems with CHP -Balance of energy demand– Types of prime movers –Economics– CHP in various sectors

Unit II Pinch Technology–significance– Selection of pinch temperature difference – Stream splitting – Process retrofit – Installation of heat pumps, heat engines - Grand composite curve.

Unit III Insulation – Recuperative heat exchanger – Run –around coil systems – Regenerative heat exchangers – Heat pumps – Heat pipes –. Waste Heat Recovery -Cogeneration Technology

Unit IV Sources of waste heat; Cogeneration - Principles of Thermodynamics - Combined Cycles Topping -Bottoming - Organic Rankine Cycles- Advantages of Cogeneration Technology

Unit V Application & techno economics of Cogeneration- Cogeneration - Performance calculations, Part load characteristics- financial considerations - Operating and Investments

REFERENCES:

1. Eastop, T.D. & Croft D.R, "Energy efficiency for engineers and Technologists", 2nd edition, Longman Harlow, 1990.

2. O'Callaghan, Paul W, "Design and Management for energy conservation", Pergamon, 1993.

3. Osborn, peter D, "Handbook of energy data and calculations including directory of products and services", Butterworths, 1980.

4. Charles H.Butler, Cogeneration, McGraw Hill Book Co., 1984.

5. Horlock JH, Cogeneration - Heat and Power, Thermodynamics and Economics, Oxford, 1987

Head
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Electrical Engineering
Mewar University, Chittorgarh (Raj.)

Power System Harmonics

Harmonic Analysis: Representation of harmonics, Fourier series and Coefficients, odd, even and half wave symmetry, phase sequence. Measures of harmonic distortion: voltage and current distortion factors, active and reactive power, apparent power, distortion power, power factor, current and voltage crest factors. Power in passive elements: power in a pure resistance, power in a pure inductance and power in a pure capacitance. Series and parallel resonance.

Harmonic Sources: Types of harmonic sources, Harmonic in transformers, normal excitation characteristics, determination of current waveshape in transformers, inrush current harmonics in transformers, Harmonic in rotating machines: mmf distribution of ac windings, slot harmonics, voltage harmonics produced by synchronous machines, rotor saliency effects, voltage harmonics produced by induction motors. Distortion caused by arcing devices: Electric arc furnaces and discharge type lighting. Distortion caused by dc power supplies.

Effects of Harmonic Distortion in Power Systems: Thermal losses in harmonic environment: Copper losses, iron losses, dielectric losses. Harmonic amplification in capacitor banks. Effects of harmonics in transformers. Effects of harmonics in rotating machines: induced emf, chorded windings, distributed winding, winding factor. Harmonic interference with power system protection: harmonic problems during fault conditions. Effects of harmonics on consumer equipment. Interference with Communications.

Limits of Harmonic Distortion: Voltage harmonic distortion limits: IEEE limits, IEC limits EN limits and NORSOK limit. Current harmonic distortion limits: IEEE limits IEC limits and NORSOK limits. 2 5.

Elimination of Power System Harmonics Passive filters: Tuned filters and damped filters Active filters: Series and parallel connection of active filters Role of power converters, transformers, rotating machines and capacitor banks in reduction of harmonics. Harmonic filter design: Series tuned filters and second order damped filters.

Reference Books:

1. "Power System Harmonics" by J. Arrillaga and N. R. Watson, Wiley

2. "Power Systems Harmonics" by George J. Wakileh, Springer

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PLANNING & OPERATION OF SMART GRID

UNIT-1 Analysis of Smart Grid System

Smart grid concepts, smart grid components and control elements, Distributed generation resources and Energy Storage, Plug-in-Hybrid Electric Vehicles (PHEV), Micro grids, Load Flow study for AC/DC power system, smart grid Monitoring, smart grid standards and policies.

UNIT-2 Smart Grid Planning

Planning Aspects of smart grid, Optimal power flow, Demand side management of smart grid, Demand response analysis of smart grid, Planning and Design of smart grid systems.

UNIT-3Voltage and frequency control of Smart Grid

(Angle/Voltage instability Phenomena, stability constraints), frequency & voltage regulations, Automatic generation Control, Tie-line power sharing, Voltage Stability assessment, Voltage and reactive power control, Shunt compensation, SVC, Voltage stability Indexing, and voltVAR support

UNIT-4 Operation and Control of Smart Grids

Operational aspects of smart grid system, Economic Dispatch, Load Dispatch Centre Functions: Contingency Analysis, preventive, Emergency and Restorative, control objectives of smart distribution system, architecture and different schemes of smart grid control, bottleneck in smart grid control, Ancillary Services

Text Books:

1. Smart Grid: Fundamentals of Design and Analysis, J. Momoh, Wiley-IEEE Press, 2012, 1st Edition.

2. Introduction to the Smart Grid: Concepts, Technologies and Evolution, S. K. Salman, IET Energy Engineering Series, 2017, 1st Edition.

3. Power System Stability and Control, PrabhaKundur, McGraw Hill Education, 2006, 1st Edition.

Reference Books:

1. Power System SCADA and Smart Grid, Mini S Thomas and J. D MacDonald, CRC Press, 2015, 1st Edition.

2. Microgrids Architecture and control, N. Hatziargyriou, Wiley-IEEE Press Series, 2013, 1st Edition.

3. Smart Grid Applications and Developments, D. Mah, P. Hills, Victor O.K. Li, R. Balme, Springer-Verlag London, 2014, 1st Edition.

DIGITAL COMMUNICATION

UNIT-I IntroductiontoDigitalCommunication:

Line coding: NRZ, RZ, Manchester encoding, differential Manchester encoding, AMI coding, high densitybipolarcode, binarywithn-zerosubstitutioncodes,

ReviewofSamplingtheorem,uniformandnon-uniformquantization,companding,μ-LawandA-Lawcompressors, Concept and Analysis of PCM, DPCM, DM and ADM modulators and demodulators, M-arywaveforms, S/N ratio for all modulation, probability of error for PCM in AWGN Channel and other modulationtechniques,DuoBinarypulse.

UNIT-IIRandomSignalTheory:

Probability, Concept of Random variable (Stationary, Non stationary, WSS, SSS), Random process, CDF, PDF,Joint CDF, Joint PDF, marginal PDF, Mean, Moments, Central Moment Auto-correlation & Cross-correlation,covariance functions, ergodicity, power spectral density, Gaussian distribution, Uniform distribution, Rayleighdistribution,Binomialdistribution,Poissiondistribution,Weinerdistribution,Wiener-Khinchintheorem,Centrallimittheorem.

UNIT-IIIDesigningofReceiver:

Analysis of digital receiver, Prediction Filter, Design and Property of Matched filter, Correlator Receiver,OrthogonalSignal,Gram-SchmidtOrthogonalizationProcedure,Maximumlikelihoodreceiver,Coherentreceiverdesign,InterSymbolInterference,EyePattern.

UNIT-IVDigitalmodulationschemes:

Coherent Binary Schemes: ASK, FSK, PSK, QPSK, MSK, G-MSK. Coherent M-ary Schemes, IncoherentSchemes (DPSK and DEPSK), Calculation of average probability of error for different modulation schemes,Power spectra of digitally modulated signals, Performance comparison of different digital modulation schemes.Reviewof2 Latest ResearchPaper.

TextBooks/ ReferenceBooks:

1. SimonHaykin,"CommunicationSystems"JohnWiley&Sons,Inc4thEdition.
2. TaubSchilling,"PrinciplesofCommunicationSystems"TMH,2ndEdition
3. GeorgeKennedy,"CommunicationSystem"TMH–4thEdition
4. B.P.Lathi,"ModernDigitalandAnalogCommunicationSystem"OxfordUniversityPress–3rdEdition.
5. DigitalCommunicationsbyJohnG.Proakis;McGraw Hill.

DYNAMIC MODELLING AND CONTROL OF SUSTAINABLE ENERGY SYSTEMS

6. **UNIT-1 Modelling of Generator:** Classical Machine Description, Voltage Generation, Open Circuit Voltage, Armature Reaction, Terminal Voltage, Power Delivered by Generator, Synchronizing Generator to an Infinite Bus, Synchronous Condenser, Role of Synchronous Machine Excitation in Controlling Reactive Power, The Park Equation, Circuit Model, Instantaneous Power Output, Applications, Synchronous Operation, Steady-state Model, Simplified Dynamic Model, Generator Connected to Infinite Bus
7. **UNIT-2 Modelling of Excitation System:** Excitation System, Excitation System Modeling, Excitation System Standard Block Diagram, System Representation by State Equation, Prime Mover Control System
8. **UNIT-3 Dynamics of a Synchronous Generator:** System Model, Synchronous Machine Model, Application of Model , Calculation of Initial Conditions, System Simulation, Consideration of Other Machine Model, Inclusion of SVC model.
9. **UNIT-4 Single machine system Modeling:** Small Signal Analysis with Block Diagram Representation, Characteristic Equation (CE) and Application of RouthHurwithzCriteion, Synchronizing and Damping Torque Analysis, Small Signal Model : State Equation, Nonlinear Oscillations Hopf Bifurcation
10. **UNIT-5 Multi-machine System: Simplified system Model, Detailed models:** Case I, Detailed models: Case II, Inclusion of Load and SVC dynamics, Modal Analysis of Large Power Systems, Case Studies.
11.
12. **Text & Reference Books:**
13. 1. Power Systems Analysis By Vijay Vittal, Bergen , Pearson Education
14. 2. Power System Dynamics By K R Padiyar, B S Publications
15. 3. Power System Stability & Control, By- P. Kundur, Tata Mcgraw hill

ADVANCED ENGINEERING MATHEMATICS

Unit I Complex Variables Review of complex variables, Conformal mapping & transformations, Function of complex variables, Pole and singularity, Integration with respect to complex argument, Residues and basic theorems on residues.

Unit II Numerical Analysis Introduction, Interpolation formulae, Difference equation, Roots of equations, Solution of simultaneous linear and non-linear equations, Solution techniques for ODE and PDE, Introduction to stability, Matrix eigen value and eigen vector problems.

Unit III Optimization Technique Calculus of several variables, Implicit function theorem, Nature of singular points, Necessary and sufficient conditions for optimization, Elements of calculus variation, Constrained Optimization, Lagrange multipliers, Gradient method, Dynamic programming.

Unit IV Linear Algebra Vector space, Linear dependence of vectors, basis, linear transformations, inner product space, rank and inverse of a matrix, solution of algebraic equations, consistency conditions, Eigen values and eigen vectors, Hermitian and Skew Hermitian matrices.

Text Books/Reference Books:

1. John B. Conway, Functions of one complex variable, Springer International.

2. James Ward Brown &Ruel V. Churchill, Complex variable and application, McGraw Hill International edition .

3. John H. Mathews, Numerical Methods for Mathematics , science and Engineering, PHI

4. D.C. Sanyal and K. Das, A text Book of Numeriacl analysis, U.N. Dhar& Sons Pvt. Ltd.

5. S.S.Rao,,Optimisation theory and application, Wiely Eastern limited Hoffman &Kunze. R, Linear Algebra, PHI Control

6. Sen, M.K and Malik, D.F.-Fundamental of Abstract Algebra, McGraw Hill.

7. Khanna, V.K. and Ghamdri, S.K.- Course of Abstract Algebra, Vikash Pub.

8. Halmos, T.R. Naïve set theory,VanNostrand.

POWER SYSTEM INSTRUMENTATION

UNIT-1 Introduction: Power generating Station – Thermal, Hydel, Nuclear, Wind – Their functional characteristics as processes, Components of power Grid – interdependency between different blocks, Review of Mechanical, Electrical, Electronics, Thermal, Optical, Pneumatic, fluidics.

Thermal Power Generation: (a) Coal handling plant – coal feed rate measurement, determination of calorific value. (b) Water treatment (c) Boiler – Feed water, pressure, temperature, steam flow rate, flue gas analysis, optical pyrometer (d) Turbine – Speed, shaft eccentricity, temperature (e) Condenser – pressure, temperature (f) Generator – Speed, hydrogen leakage (g) Control and protection systems of a thermal power plant. (h) Thermal power generation from nuclear reactor. (i) Ash handling and pollution control

Hydel Power Plant: Types - flow rate, Water pressure, **Wind Power:** Principles – synchronization with grids

UNIT-2Transformer: Transformer oil, hot spot, and moisture detection, **Transmission Lines:**Fibre optics meter for high voltage and high current measurement, Transmission line sag measurement using triangulation technique. **Tariff:** Objective, Available based tariff, Digital energy meter, Remote terminal unit (RTU)

UNIT-3Local Dispatch Centre: Data handling – Processing, Logging, Acquisition, Accounting, Display and Storage, SCADA, Techniques of Data acquisition at Central Load Dispatch Centres for coordinated control of the grid. **IS specification:** Introduction, Application and Relevancy of IS specification in perspective of power system instrumentation.

UNIT-4 Control of voltage, frequency and tie-line power flows, Q-v and P-f control loops. Mechanism of real and reactive power control. Net interchange tie-line bias control. Optimal, sub-optimal and decentralized controllers. Discrete mode AGC. Time-error and inadvertent interchange correction techniques. Online computer control. Distributed digital control. Data acquisition systems. Emergency control, preventive control, system wide optimization, Introduction to PMUs and their placement. SCADA.

Text Books/Reference Material:

1. Power System Engineering, by D.P. Kothari, I.J.Nagrath (Author)

2. Electrical Instrumentation by U.A. Bakshi, A.V. Bakshi, K.A. Bakshi, Technical Publication Pune.

3. C. L. Wadhawa "Electrical Power System" 6th edition, New Age International Publication Delhi.

FORCASTING TECHNIQUES FOR POWER SYSTEM

UNIT-1 **Introduction of power planning:** National and Regional Planning, structure of Power System, planning tools. Electricity Regulation, Electrical Forecasting, forecasting techniques modeling.**Load Forecasting:** Classification and characteristics of loads. Approaches to load forecasting. Forecasting methodology. Short-run and Long run forecasting. Energy forecasting. peak demand forecasting, total forecasting, annual and monthly peak demand forecasting. Electricity Price Forecasting.

UNIT-2 Power system Reliability: System Reliability, Reliability Planning Criteria for Generation, Transmission and Distribution, Grid Reliability, Reliability Target, Security Requirement, Disaster Management, Roadmap for Reliability and Quality

UNIT-3 Generation Planning: Objectives & Factors affecting Generation Planning, Generation Sources, Integrated Resource Planning, Generation System Model, Loss of Load (Calculation and Approaches), Outage Rate, Capacity Expansion, Scheduled Outage, Loss of Energy, Evaluation Methods. Interconnected System, Factors affecting interconnection under Emergency Assistance.

UNIT-4 Transmission & Distribution Planning: Introduction, Objectives of Transmission Planning, Network Reconfiguration, System and Load Point Indices, Data required for Composite System Reliability. Radial Networks – Introduction, Network Reconfiguration, Evaluation Techniques, Interruption Indices, Effects of Lateral Distribution Protection, Effects of Disconnects, Effects of Protection Failure, Effects of Transferring Loads, Distribution Reliability Indices

UNIT-5Demand Side Planning: Computer aided planning, wheeling. Environmental effects, the greenhouse effect. Technological impacts. Insulation coordination. Reactive compensation.

Text / References

1. Roy Billington, 'Power System Reliability Evaluation', Gordan& Breach Scain Publishers, 1990.

2. Endrenyi, J., 'Reliability modelling in Electric Power System' John Wiley, 1980.

3. Billinton Roy, Allan Ronald, 'Reliability of Power System' Plenum Press, 1996.

4. David Elmakias, 'New Computational Methods in Power System Reliability' Springer-Verlag, 2008.

5. Ali Chowdhury, Don Koval, 'Power Distribution System Reliability: Practical Methods and Applications, Wiley-IEEE Press, 2009.

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/917-A 14th July. 2018

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Computer Science & Engineering

The Board of Studies for the Department of Computer Science & Engineering is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) Tanveer Ahmed Kazi, Professor & Dean - Chairman
2. Mr. B.L. Pal, Assistant Professor & HOD - Convener
3. Prof. R. K. Somani, Principal, Bal Krishna Institute of Technology, Kota - External Member 1
4. Prof. (Dr.) Prasun Chakrabarti, Sr. Chair Professor, Techno India NJR, Udaipur -External Member 2
5. Mr. Awanit Kumar, MITRP, Alwar - Alumni
6. Mr. D. R. Yadav, Dy. G.M. (IT), BSL. LTD. Bhilwara -Member from Industry
7. Mr. Firdos Sheikh, Assistant Professor - Internal Member 1
8. Mr. Anil Dangi, Assistant Professor - Internal Member 2

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman on 20th Aug. 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoDs (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

DATE: 20th August 2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Computer Science & Engineering was held on 20th August 2018 in Room No. 135 at 10:30 am onwards to approve the new/changes in curriculum and syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) Tanveer Ahmed Kazi, Professor & Dean - Chairman
2. Mr. B.L. Pal, Assistant Professor & HOD - Convener
3. Prof. R. K. Somani, Principal, Bal Krishna Institute of Technology, Kota - External Member 1
4. Prof. (Dr.) Prasun Chakrabarti, Sr. Chair Professor, Techno India NJR, Udaipur -External Member 2
5. Mr. Awanit Kumar, MITRP, Alwar - Alumni
6. Mr. D. R. Yadav, Dy. G.M. (IT), BSL. LTD. Bhilwara -Member from Industry
7. Mr. Firdos Sheikh, Assistant Professor - Internal Member 1
8. Mr. Anil Dangi, Assistant Professor - Internal Member 2

At the outset, Mr. B.L. Pal (Head of the Department of Computer Science & Engineering) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 15-06-2017

Resolution: Minutes of the previous BOS of the Computer Science & Engineering department held on 15-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. B. L. Pal (Head, Computer Science &Engineering) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development, and Industrial collaboration.

Agenda 3: Review of Existing Programmes/ Courses (B. TECH. (CSE) & M. TECH. (CSE))

Resolution: The committee approves to reviewed of the syllabus of the B.Tech & M.Tech CSE programmes. **(Annexure 2)**

20/8/2018

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Agenda 4: Introduction of New Programme/Course

Resolution:

1. Suggestionsreceived from previous BOS committee members, five new courses will be introduced for the upcoming session 2018-19 in B.Tech CSE. The courses are mentioned below**(Annexure 3)**
    - Google Analytics
    - Digital Marketing
    - NLP
    - Embedded System
    - Bioinformatics
2. Suggestionsreceived from previous BOS committee members, two new courses will be introduced for the upcoming session 2018-19inM.Tech CSE. The courses are mentioned below **(Annexure 4)**
    - Big Data Analytics

Agenda 5: Any other suggestions by BOS Committee

Resolution: Based on the feedback of Alumni of the department, It was recommended to make Minor Project Mandatory in place of a Minor Project/Dissertation Phase-1.

Agenda 6: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

20/8/2018

MEWAR UNIVERSITY
Chittorgarh-312901 (Raj.)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

DATE: 20th August 2018

Annexure 1: Attendance Sheet

SN	Name	Designation	Post	Signature
1	Prof. (Dr.) Tanveer Ahmed Kazi	Professor & Dean	Dean-Chairman	20/08/2018
2	Mr. B. L. Pal	Assistant Professor & HOD	HOD-Convener	20/8/2018
3	Prof. S. C. Jain	CSE Department, Kota,	External Member 1	
4	Prof. (Dr.) Prasun Chakrabarti	Sr. Chair Professor, Techno India NJR, Udaipur	External Member 2	20/8/2018
5	Mr. Awanit Kumar	MITRP, Alwar	Alumni	
6	Mr. D. R. Yadav	Dy. G.M. (IT), BSL. LTD. Bhilwara	Member from Industry	20/08/18
7	Mr. Firdos Sheikh	Assistant Professor	Internal Member 1	
8	Mr. Anil Dangi	Assistant Professor	Internal Member 2	20 Aug 2018

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (Raj.)
Department of Computer Science & Engineering

GOOGLE ANALYTICS

UNIT-1

Introduction to Google Analytics- What is Web Analytics, Intro to Google Analytics, How Google Analytics Works, Why Web Analytics Matter

Questions Google Analytics Answers, The Role of Analytics in Your Buyers Journey

UNIT-2

Developing a Google Analytics Strategy, Intro to Measurement Plans, The Importance of Measurement Plans, Who Should be Involved in Creating a Measurement Plan?

Framework for Developing a Measurement Plan

UNIT-3

Best Practices for Setting Up a Google Analytics Account-How to install Google Analytics Tracking Code, How to test to confirm codes are installed and tracking correctly

Understanding the structure of your Google Analytics Account, Introduction to Views in Google Analytics, Google Analytics account limits

Understanding account users and permissions, Important Google Analytics configurations

UNIT-4

Introduction to Filters-Understanding Google Analytics filters, Google Analytics filter types, How to setup Google Analytics filters?

Conversion Tracking- What is conversion tracking? What are goals? How to setup goals, Important configurations for tracking ecommerce transactions

An overview of the Google Analytics Dashboard- An overview of reports, Understanding dimensions & metrics

REFERENCES

Google Analytics- Justin Cutroni, O'Reilly Media, Incorporated, USA, 2014

Digital Marketing

UNIT – I

Digital marketing, Understanding the Marketing Process, Increasing Visibility, Types of visibility, Examples of visibility, Visitor Engagement, Bringing Targeted Traffic, Inbound, Outbound, Understanding Conversion Process, Retention, Types of Retention,Performance Evaluation, Tools Needed.

UNIT – II

Understanding Internet, Difference between Internet & Web, understanding websites and domain names,extensions, Web server

& web hosting, different types of web servers, Planning and conceptualizing a website, building website using CMS in Class.

UNIT– III

Understanding Google Analytics, set up Analytics account, add Analytics code in a website, understanding goals and conversions, setup goals, understanding bounce rate, Difference between bouncerate and exit rate, reduce bounce rate, Monitoring traffic sources.

UNIT– IV

Marketing on Social networking websites, viral marketing and its importance, Facebook Marketing, Twitter Marketing, Linkedln Marketing, Google plus Marketing, Video Marketing, Pinterest Marketing.

UNIT – V

Introduction to SEO and its importance ,Google AdWords overview, Understanding AdWords Algorithm, creating search campaigns, Creating Ads, Tracking performance/conversion, Optimizing Search Campaigns, Creating Display Campaign.

Text Books

1. Michael Solomon and Tracy Tuten, Social Media Marketing, Pearson,2013

2. Scial Media Marketing for Beginners: Create Successful Campains, Gain more

Fans and boost sales from any social network by F.R.Media, 2/e, June 2014

3. . Jan Zimmerman and Deborah Ng. Social Media Marketing All in one forDummies, 2012

Natural Language Processing:

UNIT-1

Introduction to NLP : Definition, issues and strategies, application domain, tools for NLP, Linguistic organisation of NLP, NLP vs PLP. Word Classes : Review of Regular Expressions, CFG and different parsing techniques 1L Morphology: Inflectional, derivational, parsing and parsing with FST, Combinational Rules

UNIT-2

Phonology: Speech sounds, phonetic transcription, phoneme and phonological rules, optimality theory, machine learning of phonological rules, phonological aspects of prosody and speech synthesis. Pronunciation, Spelling and N-grams: Spelling errors, detection and elimination using probabilistic models, pronunciation variation (lexical, allophonic, dialect), decision tree model, counting words in Corpora, simple N-grams, smoothing (Add One, Written-Bell, Good-Turing), N-grams for spelling and pronunciation.

UNIT-3

Syntax: POS Tagging: Tagsets, concept of HMM tagger, rule based and stochastic POST, algorithm for HMM tagging, transformation based tagging

Sentence level construction & unification: Noun phrase, co-ordination, sub-categorization, concept of feature structure and unification.

Semantics: Representing Meaning: Unambiguous representation, canonical form, expressiveness, meaning structure of language, basics of FOPC

UNIT-4

Semantic Analysis: Syntax driven, attachment & integration, robustness Lexical Semantics: Lexemes (homonymy, polysemy, synonymy, hyponymy), WordNet, internal structure of words, metaphor and metonymy and their computational approaches Word Sense Disambiguation: Selectional restriction based, machine learning based and dictionary based approaches.

UNIT-5

Pragmatics: Discourse: Reference resolution and phenomena, syntactic and semantic constraints on Coreference, pronoun resolution algorithm, text coherence, discourse structure Dialogues: Turns and utterances, grounding, dialogue acts and structures Natural Language Generation: Introduction to language generation, architecture, dicourse planning (text schemata, rhetorical relations).

Text Book:

1. D. Jurafsky & J. H. Martin – "Speech and Language Processing – An introduction to Language processing,

Computational Linguistics, and Speech Recognition", Pearson Education

Reference Books:

1. Allen, James. 1995. – "Natural Language Understanding". Benjamin/Cummings, 2ed.

2. Bharathi, A., Vineet Chaitanya and Rajeev Sangal. 1995. Natural Language Processing- "A Pananian Perspective". Prentice Hll India, Eastern Economy Edition.

3. Eugene Cherniak: "Statistical Language Learning", MIT Press, 1993.

4. Manning, Christopher and Heinrich Schütze. 1999. "Foundations of Statistical Natural Language Processing". MIT Press.

EMBEDDED SYSTEMS

UNIT-I

INTRODUCTION TO EMBEDDED SYSTEMS: History of embedded systems, Classification of embedded systems based on generation and complexity, Purpose of embedded systems, The embedded system design process-requirements, specification, architecture design, designing hardware and software, components, system integration, Applications of embedded systems, and characteristics of embedded systems.

UNIT-II

TYPICAL EMBEDDED SYSTEM: Core of the embedded system-general purpose and domain specific processors, ASICs, PLDs, COTs; Memory-ROM, RAM, memory according to the type of interface, memory shadowing, memory selection for embedded systems, Sensors, actuators, I/O components: seven segment LED, relay, piezo buzzer, push button switch, other sub-systems: reset circuit, brownout protection circuit, oscillator circuit real time clock, watch dog timer.

UNIT-III

COMMUNICATION INTERFACE: Onboard communication interfaces-I2C, SPI, CAN, parallel interface; External communication interfaces-RS232 and RS485, USB, infrared, Bluetooth, Wi-Fi, ZigBee, GPRS, GSM.

UNIT-IV

EMBEDDED FIRMWARE DESIGN AND DEVELOPMENT: Embedded firmware design approaches-super loop based approach, operating system based approach; embedded firmware development languages-assembly language based development, high level language based development.

UNIT-V

RTOS BASED EMBEDDED SYSTEM DESIGN: Operating system basics, types of operating systems, tasks, process and threads, multiprocessing and multitasking, task scheduling: non-pre-

emptive and pre-emptive scheduling; task communication-shared memory, message passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/ Synchronization Issues, Task Synchronization Techniques

TEXT BOOKS:

1. Introduction to Embedded Systems - shibu k v, Mc Graw Hill Education.

2. Computers as Components –Wayne Wolf, Morgan Kaufmann (second edition).

3. Embedded System Design -frank vahid, tony grivargis, john Wiley.

4. Embedded Systems- An integrated approach - Lyla b das, Pearson education 2012.

5. Embedded Systems – Raj Kamal, TMH

Bio Informatics

Module I:

Introduction to Genomic data and Data Organization: Sequence Data Banks - Introduction to sequence date banks - protein sequence data bank. NBFR-PIR, SWISSPROT, Signal peptide data bank, Nucleic acid sequence data bank - GenBank, EMBL nucleotide sequence data bank, AIDS virus sequence data bank. RRNA data bank, structural data banks - protein Data Bank (PDB), The Cambridge Structural Database (CSD) : Genome data bank - Metabolic pathway data : Microbial and Cellular Data Banks.

Module II:

Introduction to MSDN (Microbial Strain Data Network): Numerical Coding Systems of Microbes, Hibridoma Data Bank Structure, Virus Information System Cell line information system; other important Data banks in the area of Biotechnology/life sciences/biodiversity. Sequence analysis: Analysis Tools for Sequence Data Banks; Pair wise alignment -NEEDLEMAN and Wunsch algorithm, Smith Waterman, BLAST, FASTA algorithms to analyze sequence data: Sequence patterns motifs and profiles.

Module III:

Secondary Structure predictions; prediction algorithms; Chao-Fasman algorithm, Hidden-Markov model, Neural Networking. Tertiary Structure predictions; prediction algorithms; Chao-Fasman algorithm, Hidden-Markov model, Neural Networking.

Module IV:

Applications in Biotechnology: Protein classifications, Fold libraries, Protein structure prediction: Fold recognition (threading), Protein structure predictions : Comparative modeling (Homology), Advanced topics: Protein folding, Protein-ligand interactions, Molecular Modeling & Dynamics, Drug Designing.

Books:

1. Lesk, Introduction to Bio Informatics, OUP

2. Introduction to Bioinformatics, Atwood, Pearson Education

3. Developing Bioinformatics Computer Skills, Cynthia Gibas and Per Jambeck, 2001 SPD

4. Statistical Methods in Bioinformatics, Springer India

5. Beginning Perl for Bio-informatics, Tisdall, SPD

6. Biocomputing: Informatics and Genome Project, Smith, D.W., 1994, Academic Press, NY

7. Bioinformatics: A practical Guide to the Analysis of Genes and Proteins, Baxevanis, A.D., Quellette, B.F.F., John Wiely & Sons.

8. Murty CSV, Bioinfornmatics, Himalaya

BIG DATA Analytics

UNIT I :

INTRODUCTION TO BIG DATA AND HADOOP Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets.

UNIT II :

HDFS(Hadoop Distributed File System) The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT III :

Map Reduce Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

Unit IV :

Hadoop Eco System Pig : Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators. Hive : Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions. Hbase : HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL : Introduction

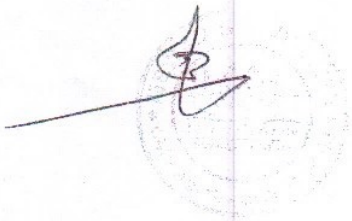
UNIT V :

Data Analytics with R Machine Learning : Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with BigR.

Text Books

1. Tom White " Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012.
2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.
3. • Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
4. • Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)
5. • Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R
6. Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.
7. • Anand Rajaraman and Jef rey David Ulman, "Mining of Massive Datasets", Cambridge University Press,
8. 2012.
9. • Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
10. • Glen J. Myat, "Making Sense of Data", John Wiley & Sons, 2007 • Pete Warden, "Big Data Glossary", O'Reily, 2011.

11. • Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.
12. • ArvindSathi, "BigDataAnalytics: Disruptive Technologies for Changing the Game", MC Press, 2012
13. • Paul Zikopoulos ,Dirk DeRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles , David Corigan ,



OFFICE OF REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No. MU/RO/2018/707-A **04th June 2018**

OFFICE ORDER

Sub: Reconstitution of Board of Studies for Department of Civil Engineering.

The Board of Studies for the Department of Civil Engineering is reconstituted as per rule 12 of the statutes of Mewar University, as under:

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg& Technology	Chairman
2	Mr. ShashivendraDulawat	Assistant Professor	Internal Member 1
3	Mr. Esar Ahmad	Assistant Professor	Internal Member 2
4	Prof. (Dr.)Anil Mehta	Principal, V.B Polytechnic, Udaipur	External Member
5	Mr. Mohd Nizamuddin Mansuri	Senior Engineer, BCE, Chanderia	Member from Industry
6	Mr. Mohammad Akram Sheikh	AE, Govt of Rajasthan	Alumni Member
7	Mr. Avinesh Kumar	Assistant Professor & HOD	Convener

The term of reference for the Board of Studies is as provided in rule 12 of the statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is that considered his/her association will contribute to the task of the meeting, with the approval of the President/Vice-Chancellor.

The Convener of the meeting is advised to hold a meeting of the BOS seeking the Convenience of the Chairman in the third week of August 2018. The proceeding of the meeting may send to the VC/Registrar as early as possible.

The External Member shall be entitled to TA/DA and sitting charges as per the norms prescribed by Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:
1. PS to Hon'ble Chairman (for kind inf)
2. PS to Hon'ble President/Pro-President (for kind inf)
3. All concerned Deans/Directors/HoDs (for kind inf & Necessary action)
4. Accounts/Examination/Library/Store/Warden/Security/IT Head.
5. Coordinator, IQAC Cell.
6. Record File.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CIVIL ENGINEERING

DATE: 17-08-2018

Minutes of Meeting of Board of Studies

Minutes of the 4th BOS of the Department of Civil Engineering meeting held on 17-08-2018 at 11.30 AM.

The following members were present: **(Annexure 1)**

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg& Technology	Chairman
2	Mr. Shashivendra Dulawat	Assistant Professor	Internal Member 1
3	Mr. Esar Ahmad	Assistant Professor	Internal Member 2
4	Prof. (Dr.)Anil Mehta	Principal, V.B Polytechnic, Udaipur	External Member
5	Mr. Mohd Nizamuddin Mansuri	Senior Engineer, BCE, Chanderia	Member from Industry
6	Mr. Mohammad Akram Sheikh	AE, Govt of Rajasthan	Alumni Member
7	Mr. Avinesh Kumar	Assistant Professor & HOD	Convener

At the outset, Mr. Avinesh Kumar, Head of the Department of Civil Engineering, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 15-06-2017

Resolution: Minutes of the previous BOS of the Civil Engineering Department held on 15-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. Avinesh Kumar (Head, Civil Engineering) presented departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development and Industrial collaboration.

Agenda 3: Revision of Existing Programmes/ Courses

Resolution: The Committee reviewed scheme and syllabus of B. Tech (Civil Engineering) and M. Tech Programme (Transportation Engineering and Structural Engineering) and

approved scheme and syllabus of B. Tech and M. Tech Programme (Transportation Engineering and Structural Engineering) for the session 2018-19. **(Annexure 2)**

Agenda 4: Introduction of New Programmes/ Course

Resolution:

1. The BOS Committee approved the syllabus of four new courses in B. Tech. Civil Engineering from session 2018-19 is mentioned below. **(Annexure 3)**

- Computational Methods in Civil Engineering
- Building Information and Modeling(BIM)
- Introduction to Soft Computing
- Enviromental Impact Assesment and Management

2. The BOS Committee approved the syllabus of one new courses in M. Tech. Structural Engineering from session 2018-19 is mentioned below. **(Annexure 4)**

- Evaluation and Retrofitting of Buildings

Agenda 5: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

Annexure 1: Attendance Sheet

Date: 17.08.2018

S N	Name	Designation	Post	Signature
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg & Technology	Chairman	17/08/2018
2	Mr. Shashivendra Dulawat	Assistant Professor	Internal Member 1	17/08/2018
3	Mr. Esar Ahmad	Assistant Professor	Internal Member 2	17-08-2018
3	Prof. (Dr.) Anil Mehta	Principal, V.B Polytechnic, Udaipur	External Member	17/08/2018
4	Mr. Mohd Nizamuddin Mansuri	Senior Engineer, BCE, Chanderia	Member from Industry	17/08/2018
5	Mr. Mohammad Akram Sheikh	AE, Govt of Rajasthan	Alumni Member	17-08-2018
6	Mr. Avinesh Kumar	Assistant Professor & HOD	HOD-Convener	17/08/2018

17/08/2018

Mr. Avinesh Kumar
HOD, Civil Engineering

LIST OF DEPARTMENTAL ELECTIVES (25)
CE-421/422/423/424

- Quantity Survey and Valuation
- Prestressed Concrete Structures
- Ground Improvement Techniques
- Solid and Hazardous Waste Management
- Hydro Power Engineering
- Optimization Techniques for Civil Engineering
- Bridge Engineering
- Highway & Airfield Pavement Design
- Sustainable Construction Method
- Energy-Efficient Building Design```
- Geo-synthetics and Reinforced Soil Structures
- Building Information and Modeling
- Computational Hydraulics
- Finite Element Methods
- Traffic Engineering
- Environmental Pollution Control
- Hydraulic Structures
- Retrofitting and Rehabilitation of Structures
- Machine Foundations
- Rock Mechanics
- Structural Dynamics and Seismic Design
- Probability Methods in Civil Engineering
- Structural Health Monitoring (SHM)
- Computational Methods in Civil Engineering
- Environmental Impact Assessment and Management

LIST OF OPEN ELECTIVES (12)
OE-431/432

- Operations Management
- Advanced Engineering Mathematics
- Entrepreneurship
- Soft Computing
- Artificial Intelligence
- Remote Sensing & GIS
- Renewable Energy Sources
- Consumer Electronics
- Security in Computing
- Modeling and Simulation
- Microprocessors and Microcontrollers
- Civil Engineering Estimating & Costing

B.TECH (7th SEMESTER) CIVIL ENGINEERING
CE-421/422/423/424 COMPUTATIONAL METHODS IN CIVIL ENGINEERING

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50
Marks External Examination: 50
Marks Duration of Examination: 03 Hours

Course Objective:

1. Understand the basic principles and concepts of computational methods in civil engineering.
2. Apply numerical analysis techniques to solve civil engineering problems.
3. Develop computer programs using appropriate programming languages for civil engineering applications.
4. Analyze and interpret the results obtained from computational models and simulations.
5. Apply computational methods to structural analysis problems, including determinate and indeterminatestructures.
6. Apply computational methods to fluid mechanics problems, such as pipe flow, open channel flow, andhydraulic structures.

UNIT – I	Introduction to Computational Methods: Overview of computational methods in civil engineering, Introduction to numerical methods and their applications, Error analysis and approximation techniques, Introduction to programming languages (e.g., Python, MATLAB) for civil engineering applications
UNIT – II	Finite Element Method: Fundamentals of the finite element method, Discretization and interpolationtechniques, Assembly and solution of linear systems, Applications of the finite element method in structural analysis and design
UNIT –III	Computational Fluid Dynamics: Introduction to computational fluid dynamics (CFD), Governing equations of fluid flow and their discretization, Solution techniques for CFD problems, Applicationsof CFD in civil engineering (e.g., flow around structures, hydraulic systems)
UNIT - IV	Optimization Methods: Introduction to optimization in civil engineering, Formulation of optimization problems, Unconstrained and constrained optimization algorithms, Applications of optimization in civil engineering design and analysis

References

- "Finite Element Procedures" by K.J. Bathe
- "Computational Fluid Dynamics: The Basics with Applications" by John D. Anderson Jr.
- "Optimization Concepts and Applications in Engineering" by Ashok D. Belegundu and Tirupathi R. Chandrupatla
- "Applied Data Science for Civil and Environmental Engineers" by Fan Zhang, ElpinikiApostolaki-Iosifidou, and Alessandro Selvitella

B.TECH (7th SEMESTER) CIVIL ENGINEERING
CE-421/422/423/424 BUILDING INFORMATION AND MODELING

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50
Marks External Examination: 50
Marks Duration of Examination: 03 Hours

Course Objective:

1. Understand the fundamental concepts and principles of Building Information Modeling (BIM).
2. Explain the benefits and advantages of using BIM in the construction industry.
3. Create and manage digital models using BIM software tools.
4. Apply BIM techniques for various stages of a construction project, including design, construction, andfacility management.
5. Collaborate effectively with multidisciplinary project teams using BIM-based workflows.
6. Analyze and evaluate design alternatives using BIM-based simulations and visualizations.
7. Identify and resolve conflicts and clashes within a BIM model.

UNIT – I	Introduction to BIM and its benefits, BIM software and tools overview, BIM project lifecycle and processes, BIM standards and protocols. BIM Modeling and Collaboration and principles, BIM elements and families, BIM coordination and clash detection, Collaborative BIM platforms and workflows.
UNIT – II	BIM Data Management and Visualization, BIM data management and organization, BIM data interoperability and exchange, BIM visualization and rendering techniques, BIM data analysis and reporting..
UNIT – III	BIM in Design and Construction, BIM in architectural design and modeling, BIM in structural engineering and analysis, BIM in MEP (Mechanical, Electrical, Plumbing) systems design, BIM in construction planning and scheduling..
UNIT - IV	BIM Implementation and Project Case Studies, BIM implementation strategies and challenges, BIMproject execution plans, BIM case studies and best practices, Emerging trends in BIM and future directions.

References

- "Building Information Modeling: Framework for Structural Design" by Nawari, N. O.
- "BIM and Construction Management: Proven Tools, Methods, and Workflows" by Levy, S.M. and Poole Jr., F. W.
- "BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors" by Eastman, C., Teicholz, P., Sacks, R., and Liston, K.
- "BIM for Construction Health and Safety" by Marsh, S., Ambrose, M., and Waskett, P.
- "BIM in Small-Scale Sustainable Design" by Garcia, F., Al-Hussein, M., and Al-Hussein,M.

B.TECH (7th SEMESTER) CIVIL ENGINEERING
CE-421/422/423/424 COMPUTATIONAL HYDRAULICS

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50
Marks External Examination: 50
Marks Duration of Examination: 03 Hours

Course Objective:

Understand the fundamental principles and equations governing fluid flow in hydraulic systems., Apply numerical methods and computational techniques to solve hydraulic problems., Analyze and model flow behavior in open channel and pipe networks, Simulate and predict hydraulic phenomena using computational fluid dynamics (CFD) software., Evaluate the performance of hydraulic structures and systems through numerical simulations.

UNIT – I	Introduction to Computational Hydraulics, Overview of computational methods in hydraulics, Applications and benefits of computational hydraulics, Challenges and limitations of numerical modeling in hydraulics, Introduction to relevant software and programming languages, Governing Equations for Fluid Flow, Continuity equation and conservation of mass, Navier-Stokes equations forincompressible flow, Simplifications and assumptions in hydraulic modeling, Boundary conditions and initial conditions, Numerical Methods for Fluid Flow, Finite difference methods, Finite volume methods, Finite element methods, Discretization and spatial interpolation techniques
UNIT – II	Flow in Open Channels, Hydraulic profiles and energy equations, Subcritical and supercritical flow, Numerical modeling of open channel flow, Design and analysis of channel sections and profiles, Flowin Pipe Networks, Pipe flow equations and friction losses, Pipe network analysis methods, Hydraulic grade line and energy grade line, Modeling and optimization of pipe networks, Computational Fluid Dynamics (CFD) Basics, Introduction to CFD software and tools, Grid generation and meshing techniques, Turbulence modeling and simulation, Verification and validation of CFD models
UNIT – III	CFD Applications in Hydraulic Engineering, Modeling of flow in hydraulic structures (e.g., weirs, spillways), Analysis of flow patterns and hydraulic jumps, Sediment transport and scour modeling, Wave and coastal processes simulation, Hydraulic Structure Design and Analysis, Design and analysis of dams and reservoirs, Simulation of flow through hydraulic gates and valves, Modeling ofhydraulic pumps and turbines, Performance evaluation and optimization of hydraulic systems, Hydraulic Modeling for Flood Analysis, Flood routing and hydrologic modeling, Hydraulic modeling for floodplain analysis, Assessment of flood risk and mitigation measures, Real-time flood forecastingand warning systems.
UNIT - IV	Environmental Hydraulics and Water Quality Modeling, Modeling of pollutant transport and dispersion, Mixing and dilution in rivers and estuaries, Water quality assessment and management, Environmental impact assessment using hydraulic models, Uncertainty and Sensitivity Analysis in Computational Hydraulics, Sources of uncertainty in hydraulic modeling, Sensitivity analysis and parameter estimation, Monte Carlo simulations and probabilistic modeling, Risk analysis and decision-making under uncertainty, Case Studies and Project Work, Analysis of real-world hydraulic engineering projects, Hands-on experience with computational hydraulics software, Project work involving hydraulic modeling and analysis, Presentation and discussion of project findings

References

- Introduction to Computational Fluid Dynamics" by Pradip Niyogil.
- "Numerical Computation of Internal and External Flows" by Hirsch C

B.TECH (7th SEMESTER) CIVIL ENGINEERING

CE-421/422/423/424 ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT

L	T	P	Cr
3	1	-	4

Internal Evaluation: 50
Marks External Examination: 50
Marks Duration of Examination: 03 Hours

Course Objective:

1. The objective of the Environmental Impact Assessment (EIA) course is to provide students with a comprehensive understanding of the principles, methodologies, and techniques involved in assessing the potential environmental impacts of development projects. 2. The course aims to equip students with the knowledge and skills necessary to evaluate the environmental consequences of various activities, propose appropriate mitigation measures, and contribute to sustainable development practices.

UNIT – I	Introduction to Environmental Impact Assessment: Definition, purpose, and importance of EIA Historical background and evolution of EIA Legal and regulatory frameworks for EIA, EIA Process and Stakeholder Engagement, Phases of the EIA process: scoping, impact assessment, mitigation, and monitoring Public participation and stakeholder engagement in the EIA process Decision-making and review of EIA reports Screening and Scoping. Screening criteria and methods for determining project significance Scoping process: identifying project impacts, establishing baseline conditions, and setting assessment boundaries
UNIT – II	Impact Identification and Assessment: Identification and classification of potential environmental impacts Techniques for impact prediction and modeling Methods for assessing impacts on various environmental components (e.g., air, water, land, biodiversity) Mitigation Measures and Alternatives Analysis: Principles and strategies for developing effective mitigation measures Evaluation of alternative project designs and locations Cost-benefit analysis and trade-off considerations
UNIT – III	Environmental Management Plans and Monitoring: Development of environmental management plans (EMP)Design and implementation of environmental monitoring programs Compliance monitoring and enforcement mechanisms Case Studies and Practical Applications: Analysis of real-world EIA case studies from different sectors (e.g., infrastructure, energy, mining) Review of successful and problematic EIA practices Integration of environmental considerations into project decision-making
UNIT - IV	Emerging Trends in EIA: Climate change considerations in EIA Strategic Environmental Assessment (SEA) and sustainability appraisal Use of technology (e.g., remote sensing, GIS) in EIA Ethical and Social Dimensions of EIA: Ethical considerations in EIA decision-making, Social impact assessment and community engagement .Indigenous and local knowledge integration

References

- "Environmental Impact Assessment: Theory and Practice" by Peter Wathern
- Environmental Impact Assessment: A Practical Guide" by Betty Bowers Marriott
- Methods in Environmental Impact Assessment" edited by Peter Morris and Riki Therivel
- Environmental Impact Assessment: A Guide to Best Professional Practices" edited by Charles
- H. Eccleston and Ana I. Pérez-Maqueo
- Environmental Impact Assessment: Practical Solutions to Recurrent Problems" by David P.Lawrence and Clive Phillips

LIST OF ELECTIVES

ELECTIVE - I

1.	SE-711	Advanced Concrete Technology
2.	SE-713	Pre Stressed Concrete Structure
3.	SE-715	Masonry structures
4.	SE-717	Sustainable materials and construction

ELECTIVE - III

1.	SE-712	Reliability based structural design
2.	SE-714	Design of Tall Building
3.	SE-716	Wind Resistance Design of Structures
4.	SE-718	Advanced Foundation Engineering

ELECTIVE - II

1.	SE-721	Stability Theory And Structural analysis
2.	SE-723	Soil Structure Interaction
3.	SE-725	Maintenance and Rehabilitation of Structures
4.	SE-727	Design of Offshore structures

ELECTIVE - IV

1.	SE-722	Artificial Intelligence in Structural Engineering Applications
2.	SE-724	Fracture and Fatigue Mechanics
3.	SE-726	Advanced Numerical Methods
4.	SE-728	Evaluation and Retrofitting of Buildings

MEWAR UNIVERSITY
Department of Civil Engineering

M TECH: STRUCTURAL ENGINEERING
Evaluation and Retrofitting of Buildings

UNIT – I

Deterioration of concrete buildings, embedded metal corrosion, disintegration mechanisms, moisture effects

UNIT – II

Evaluation of concrete buildings, visual investigation, destructive testing systems, non-destructive testing technique testing.

UNIT – III

Structural health monitoring, vibration based monitoring technique, smart materials and sensors

UNIT – IV

Surface repair and retrofitting techniques, strategy & design, selection of repair materials, surface preparation methods.

UNIT – V

Strengthening techniques, Strengthening techniques, beam shear capacity Strengthening, shear transfer Strengthening, and crack stabilization. Seismic rehabilitation of existing buildings, seismic vulnerability and strategies for seismic retrofit.

Reference Books:

1. Emmons, P.H., "Concrete Repair and Maintenance Illustrated', Galgotia Publications Pvt.
2. Bungey, S., Lillard, G. and Grantham, M.G., "Testing of Concrete in Structures" , Taylor and Francis.
3. Malhotra, V.M.and Carino, N.J., Handbook on Non-destructive Testing of Concrete, CRC Press.
4. Bohni, H.,"Corrosion in Concrete Structures" , CRC Press.
5. FEMA 273; NEHRP Guidelines for the Seismic Rehabilitation of Buildings.
6. ATC-40:Seismic Evaluation and Retrofit of Concrete Buildings, Vol.1&2

OFFICE OF REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No. MU/RO/2018/ 309-A

20th March, 2018

OFFICE ORDER

Sub: Reconstitution of Board of Studies for Department of Mechanical Engineering.

The Board of Studies for the Department of Mechanical Engineering is reconstituted as per rule 12 of the statutes of Mewar University, as under:

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg& Technology	Chairman
2	Mr. Kapil Nahar	Assistant Professor & HOD	HOD-Convener
3	Dr. Rakesh Bandhari	Professor & Dean Research Sangam University, Bhilwara	External Member
4	Mr. Upeesh Jain	Sr. Engineer, Jindal Saw Limited, Bhilwara	Member from Industry
5	Dr. Rahul Lodha	Associate Professor	Internal Member 1
6	Mr. Dinesh Kumar	Assistant Professor	Internal Member 1
7	Mr. Sunil Kumar Katheria	Assistant Professor	Internal Member 2
8	Mr. Chandersh Singh	Suncity Steel Pvt Ltd, Jodhpur	Alumni Member

The term of reference for the Board of Studies are as provide in rule 12 of the statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is that considered his/her association will contribute in the task of the meeting, with the approval of the President/Vice Chancellor.

The Convener of the meeting is advised to hold meeting of the BOS seeking Convenience of the Chairman. The proceeding of the meeting may send to the VC/Registrar as early as possible.

The External Member shall be entitled for TA/DA and sitting charges as per the norms prescribed by the Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

1. PS to Hon'ble Chairman (for kind inf)
2. PS to Hon'ble President/Pro-President (for kind inf)
3. All concerned Deans/Directors/HoD's (for kind inf & Necessary action)
4. Accounts/Examination/Library/Store/Warden/Security/IT Head.
5. Coordinator, IQAC Cell.
6. Record File.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF MECHANICAL ENGINEERING

DATE: 08-06-2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Mechanical Engineering meeting held on 08-06-2018 at 11.30 AM.

The following members were present: **(Annexure 1)**

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg& Technology	Chairman
2	Mr. Kapil Nahar	Assistant Professor & HOD	HOD-Convener
3	Dr. Rakesh Bandhari	Professor & Dean Research Sangam University, Bhilwara	External Member
4	Mr. Upeesh Jain	Sr. Engineer, Jindal Saw Limited, Bhilwara	Member from Industry
5	Dr. Rahul Lodha	Associate Professor	Internal Member 1
6	Mr. Dinesh Kumar	Assistant Professor	Internal Member 1
7	Mr. Sunil Kumar Katheria	Assistant Professor	Internal Member 2
8	Mr. Chandersh Singh	Suncity Steel Pvt Ltd, Jodhpur	Alumni Member

Mr. Kapil Nahar (Head, Department of Mechanical Engineering) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 15-06-2017

Resolution: Minutes of the previous BOS of the Mechanical Engineering Department held on 15-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. Kapil Nahar (Head, Mechanical Engineering) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development and Industrial collaboration.

Agenda 3: Revision of Existing Programmes/ Courses

8/6/18

MEWAR UNIVERSITY Chittorgarh - 312901 (Raj.)

Resolution: The Committee reviewed the scheme and syllabus of B. Tech (Mechanical Engineering) and M. Tech Programme (MSE and Thermal Engineering) and approved it without any change for the session 2018-19.

Agenda 4: Introduction of New Programmes/ Course

Resolution:

1. As per suggestions received from the members of the previous BOS committee, four new courses were introduced in the B.Tech Mechanical Engineering for the upcoming session 2018-19 as follows. The detailed syllabus is attached as **Annexure 2.**
   - Sustainable Design and Green Engineering
   - Additive Manufacturing and 3D Printing
   - Aerospace Engineering
   - Automotive Engineering
2. As per suggestions received from the members of the previous BOS committee, one new course was introduced in the M. Tech. Manufacturing System Engineering for the upcoming session 2018-19 is as follows. The detailed syllabus is attached as **Annexure 3.**

- Data Analytics for Manufacturing Systems

3. As per suggestions received from the members of the previous BOS committee, one new course was introduced in the M. Tech. Thermal Engineering for the upcoming session 2018-19 is as follows. The detailed syllabus is attached as **Annexure 4.**

- Advanced Combustion and Emissions Control

Agenda 5: Any other suggestions by the BOS committee

Resolution: The BOS Committee suggested more research-oriented approach among M. Tech students.

Agenda 6: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

8/6/18

MEWAR UNIVERSITY Mewar University Knowledge to Wisdom Chittorgarh - 312901 (Raj.)

Annexure 1: Attendance Sheet

SN	Name	Designation	Post	Signature
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg& Technology	Chairman	
2	Mr. Kapil Nahar	Assistant Professor & HOD	HOD-Convener	
3	Dr. Rakesh Bandhari	Professor & Dean Research Sangam University, Bhilwara	External Member	08-06-2018
4	Mr. Upeesh Jain	Sr. Engineer, Jindal Saw Limited, Bhilwara	Member from Industry	
5	Dr. Rahul Lodha	Associate Professor	Internal Member 1	
6	Mr. Dinesh Kumar	Assistant Professor	Internal Member 1	
7	Mr. Sunil Kumar Katheria	Assistant Professor	Internal Member 2	08/06/18
8	Mr. Chandersh Singh	Suncity Steel Pvt Ltd, Jodhpur	Alumni Member	08/06/2018

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

Sustainable Design and Green Engineering

Unit 1: Principles of Sustainable Design
Understanding the triple bottom line: Considering social, environmental, and economic factors in design decisions.
Minimizing environmental impact: Designing with the goal of reducing resource consumption, waste generation, and pollution.
Design for durability and longevity: Creating products and systems that have a long lifespan and can be easily repaired or upgraded.

Unit 2: Life Cycle Assessment and Environmental Impact Analysis
Life cycle assessment (LCA): Evaluating the environmental impacts of a product or system throughout its entire life cycle, from raw material extraction to disposal.
Environmental impact analysis: Assessing the potential environmental effects of a design project or process, including air and water pollution, greenhouse gas emissions, and habitat destruction.

Unit 3: Sustainable Materials and Manufacturing Processes
Material selection: Choosing materials with lower environmental impact, such as recycled or renewable materials.
Green chemistry: Designing chemical processes and materials that minimize toxicity and waste generation.
Lean manufacturing: Implementing efficient manufacturing processes to minimize resource consumption and waste generation.

Unit 4: Green Building Design and Energy Efficiency
Energy-efficient design strategies: Incorporating passive design techniques, such as orientation, insulation, and natural lighting, to reduce energy consumption in buildings.
Renewable energy integration: Incorporating renewable energy systems like solar panels or geothermal heating/cooling to meet a building's energy needs.
Water efficiency: Designing systems for rainwater harvesting, greywater recycling, and efficient water use in buildings.

Unit 5: Sustainable Waste Management and Recycling
Waste reduction and source separation: Implementing strategies to minimize waste generation and segregate recyclable materials.
Recycling technologies and processes: Exploring different recycling methods for various materials, such as paper, plastic, glass, and metals.
Circular economy principles: Designing products and systems to maximize material reuse, recycling, and resource recovery, aiming to minimize waste sent to landfills.

Additive Manufacturing and 3D Printing Technologies

Unit 1: Introduction to Additive Manufacturing and 3D Printing Technologies
Definition and principles of additive manufacturing (AM) and 3D printing.
Distinctions between traditional manufacturing methods and additive manufacturing.
Overview of the historical development and advancements in 3D printing technologies.

Unit 2: Additive Manufacturing Processes
Extrusion-based processes: Understanding Fused Deposition Modeling (FDM) and other extrusion-based techniques.
Powder bed fusion processes: Exploring Selective Laser Sintering (SLS) and Electron Beam Melting (EBM) methods.
Stereolithography: Explaining the process of curing liquid resin using light exposure.

Unit 3: Design for Additive Manufacturing
Design considerations for AM: Understanding the unique possibilities and constraints of additive manufacturing.
Generative design: Using algorithms and computational tools to optimize designs for additive manufacturing.
Topology optimization: Redesigning parts to minimize material usage and maximize performance through AM.

Unit 4: Material Selection and Characterization
Materials used in 3D printing: Overview of plastics, metals, ceramics, and composites suitable for additive manufacturing.
Material properties and characterization: Evaluating mechanical, thermal, and chemical characteristics of AM materials.
Material testing and qualification: Ensuring material performance and quality for specific applications.

Unit 5: Applications of 3D Printing in Various Industries
Aerospace industry: Discussing the use of 3D printing for lightweight components, complex geometries, and rapid prototyping.
Automotive industry: Exploring the applications of 3D printing in vehicle parts, tooling, and customization.
Healthcare industry: Examining the use of 3D printing in medical implants, prosthetics, anatomical models, and drug delivery systems.
Consumer products and electronics: Highlighting the role of 3D printing in customized products, electronics prototyping, and small-scale production.
Architecture and construction: Discussing the use of 3D printing for building components, architectural models, and rapid prototyping in construction projects.

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

Aerospace Engineering

Unit 1: Introduction to Aerospace Systems and Vehicles
Overview of aerospace engineering: Introduction to the field, its history, and key concepts.
Types of aerospace vehicles: Differentiating between aircraft (fixed-wing, rotary-wing) and spacecraft (satellites, rockets).
Aerospace systems: Understanding the components and subsystems that make up aerospace vehicles.

Unit 2: Aerodynamics and Flight Mechanics
Principles of aerodynamics: Understanding the forces acting on an aircraft or spacecraft during flight, such as lift, drag, and thrust.
Flight mechanics: Exploring the equations of motion and stability of aerospace vehicles.
Control surfaces and stability: Analyzing the role of control surfaces (elevator, rudder, ailerons) in maneuvering and maintaining stability.

Unit 3: Aircraft and Spacecraft Design Principles
Design considerations: Discussing factors such as mission requirements, performance, safety, and environmental impact in aerospace vehicle design.
Configuration design: Exploring different aircraft and spacecraft configurations, such as monoplanes, biplanes, and delta wings.
Structural design: Understanding the principles of structural design, load analysis, and stress distribution in aerospace vehicles.

Unit 4: Propulsion Systems
Principles of propulsion: Exploring different propulsion technologies, such as jet engines, turboprops, and rockets.
Engine performance: Understanding the thermodynamics and efficiency of propulsion systems.
Propulsion integration: Examining the integration of propulsion systems with aerospace vehicles and the impact on performance.

Unit 5: Aerospace Materials and Structural Analysis
Aerospace materials: Understanding the properties and characteristics of materials used in aerospace engineering, including metals, composites, and advanced alloys.
Structural analysis: Exploring methods for analyzing and designing aerospace structures, such as finite element analysis and stress calculations.
Fatigue and failure analysis: Studying the effects of cyclic loading, stress concentrations, and material degradation on structural integrity.

MEWAR UNIVERSITY Chittorgarh-312901

Automotive Engineering

Unit 1: Vehicle Dynamics and Control

Handling and stability: Understanding the principles of vehicle dynamics, including cornering, yaw, and roll.

Suspension systems: Exploring the design and characteristics of suspensions for improved ride comfort and handling.

Steering and braking systems: Analyzing the design and control of steering and braking systems for precise vehicle control.

Unit 2: Powertrain Systems and Vehicle Propulsion

Engine technology: Understanding different types of engines, including internal combustion engines, hybrid powertrains, and electric motors.

Transmission systems: Exploring manual and automatic transmissions, as well as continuously variable transmissions (CVTs).

Alternative propulsion systems: Investigating the design and operation of hydrogen fuel cells, electric vehicle (EV) batteries, and other emerging technologies.

Unit 3: Automotive Safety and Crashworthiness

Crashworthiness: Understanding the design and evaluation of vehicle structures to protect occupants during collisions.

Active and passive safety systems: Exploring technologies such as anti-lock braking systems (ABS), electronic stability control (ESC), airbags, and advanced driver assistance systems (ADAS).

Crash testing and analysis: Studying the methods and procedures used to evaluate the crashworthiness and occupant protection of vehicles.

Unit 4: Vehicle Design and Aerodynamics

Vehicle styling and design: Exploring the principles of aerodynamics, aesthetics, ergonomics, and packaging in automotive design.

Wind tunnel testing and computational fluid dynamics (CFD): Analyzing the techniques used to optimize vehicle aerodynamics and reduce drag.

Lightweight design: Investigating materials and techniques for reducing vehicle weight while maintaining structural integrity and safety.

Unit 5: Emerging Trends in Automotive Technologies

Electric vehicles (EVs): Understanding the design, operation, and infrastructure requirements of electric vehicles.

Autonomous driving: Exploring the technology and challenges associated with self-driving cars, including perception, decision-making, and sensor integration.

Connected vehicles: Investigating the integration of vehicles with communication technologies for enhanced safety, convenience, and traffic management.

MEWAR UNIVERSITY Chittorgarh (Raj.)

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/302-A **16th March 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Paramedical Science

The Board of Studies for the Department of Paramedical Scienceis reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Dr. Tanveer Ahmad Kazi, Dean, Faculty of Health Science - Chairman
2) Mr. Suresh Kumar Mahaseth, Lecturer, Dept. of MLT, IIT Dwarka, New Delhi. - External Member
3) Dr. K.C. Jain, Radiologist - External Member
4) Dr. Sandeep Vaishnav, Assistant Professor. - Internal Member
5) Ms. Shanti Nath, Assistant Professor. - Internal Member
6) Dr. S.L. Mundra, Senior Medical Officer - Internal Member
7) Mr. Simant Hansda - Alumni
8) Mrs. Jaya Bharti, Head & Assistant professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the first week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PARAMEDICAL SCIENCES

DATE: 06.06.2018

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Paramedical Science was held on 06th June 2018 in Room No. 135 at 11:00 am onwards to approve the new curriculum and syllabus for session 2018-19. The following members were present: **(Annexure 1)**

1) Dr. Tanveer Ahmad Kazi, Dean, Faculty of Health Science - Chairman
2) Mr. Suresh Kumar Mahaseth, Lecturer, Dept. of MLT, IIT Dwarka, New Delhi. - External Member
3) Dr. K.C. Jain, Radiologist - External Member
4) Dr. Sandeep Vaishnav, Assistant Professor. - Internal Member
5) Ms. Shanti Nath, Assistant Professor. - Internal Member
6) Dr. S.L. Mundra, Senior Medical Officer - Internal Member
7) Mr. Simant Hansda - Alumni
8) Mrs. Jaya Bharti, Head & Assistant professor - Convener

Mrs. Jaya Bharti (Head, Department of Paramedical) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 05-06-2017

Resolution: Minutes of the previous BOS of the Paramedical Department held on 05-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mrs. Jaya Bharti (Head, Paramedical) presented a departmental activity report mentioning all the activities conducted related to curricular development, research development, faculty development and Industrial collaboration.

Agenda 3: Review of Existing Programmes/Courses

Resolution: The Committee reviewed and approved the scheme and syllabus of courses for BMLT, B.Sc Cardiac Care and M.Sc MLT for the upcoming session from 2018-19.**(Annexure 2)**

Agenda 4: Introduction of New Programmes/Course

Resolution:

The suggestion received from previous BOS committee members that a new programme BRIT will be started in the upcoming session 2018-19. A listing of practical and marks distribution (scheme of practical) should be done and appended with the syllabus.**(Annexure 3)**

MEWAR UNIVERSITY Chittorgarh-312901 (Raj.)

- BRIT

Agenda 5: Any other suggestions by BOS Committee

Resolution:

- As per the suggestions received from external members of BOS, it is decided that there should be a hospital facility for students which can provide practical exposure to the students.
- Some of the instruments such as X-ray machines should be present in the laboratory for Radio-Imaging students.
- Facilities required and approval from the paramedical council were also discussed in the meeting.

Agenda 6: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.:MU/RO/2018/ 706-A **4th June 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Mathematics

The Board of Studies for the Department of Mathematicsis reconstituted as per Rule12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) R K Paliwal, Dean, Faculty of Science & Technology - Chairman
2. Dr. R K Laddha , Assistant Professor, MLV, Govt College Bhilwara - External Member
3. Mr. Sanjeev Sharma, Assistant Professor - Internal Member
4. Dr. Pramod Mehta, Assistant Professor - Internal Member
5. Ms. Priyanka Dhaker - Alumni
6. Dr. Jytoi Singh Raghav, Assistant Professor & Head - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the third week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF MATHEMATICS

DATE: 18.06.2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Mathematics meeting held on 18.06.2018 at 11.30 AM.

The following members were present:**(Annuxure 1)**

1. Prof. (Dr.) R K Paliwal, Dean, Faculty of Science & Technology - Chairman
2. Dr. R K Laddha , Assistant Professor, MLV, Govt College Bhilwara - External Member
3. Mr. Sanjeev Sharma, Assistant Professor - Internal Member
4. Mr. Pramod Mehta, Assistant Professor - Internal Member
5. Ms. Priyanka Dhaker - Alumni
6. Dr. Jytoi Singh Raghav, Assistant Professor & Head - Convener

Dr. Jyoti Singh Raghav, Head, Department of Mathematics, welcomes the BOS member.

Agenda 1: To approve minutes of the previous BOS, held on 22-07-2017

Resolution: Minutes of the previous BOS of the Mathematics Department held on 22-07-2017 were discussed and approved.

Agenda 2: Revision in the scheme of the M.Sc. Mathematics (Annuxure 2)

Resolution: On the suggestion of the external members of BOS and alumni in the III semester there are IV core courses and two elective courses and remove the minor project from the III semester. Also in IV semester Major research or project is replaced by 3 Courses and Minor research projects.

Agenda 3: The Revision of the scheme and syllabus of M.Sc. Mathematics.

Resolution: The BOS Committee Members discuss and approved the revised scheme and syllabus of M. Sc Mathematics.

Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY * Chittorgarh - 312901 (Raj.) *

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR (CHITTORGARH) RAJASTHAN

Ref. No.: MU/RO/2018/1095A **26th August 2018**

OFFICE ORDER

Sub: Reconstitution of Board of Studies for Department of Physiotherapy

The Board of Studies for the Department of Physiotherapy is reconstituted as per Rule 12 of Statutes of Mewar University , as under:

1. Prof. (Dr.) R.K Paliwal, Dean Academics - Chairman
2. Dr. Ajeet Kumar Saharan, Principal, Jaipur Physiotherapy College - External Member
3. Dr. Shekhar Singh, Assistant Professor, Jaipur Physiotherapy College - External Member
4. Ms. Shanti Nath, Assistant Professor - Internal Member
5. Ms. Jaya Bharti, Assistant Professor - Internal Member
6. Dr. Sandeep Vaishnav, Head & Physiotherapy - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting as special invitee if it is considered his association will be contribute in the task of the meeting, with the approval of President/ Vice-Chancellor.

The Convener of the Meeting is advised to hold the meeting of BOS seeking convenience of the Chairman on second week of September 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

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- PS to Hon'ble Pro-President (for kind information)
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- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHYSIOTHERAPY

DATE: 13th September 2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Physiotherapy meeting held on 13-09-2018 at 11.30 AM in room no. 135.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) R.K Paliwal, Dean Academics - Chairman
2. Dr. Ajeet Kumar Saharan, Principal, Jaipur Physiotherapy College - External Member
3. Dr. Shekhar Singh, Assistant Professor, Jaipur Physiotherapy College - External Member
4. Ms. Shanti Nath, Assistant Professor - Internal Member
5. Ms. Jaya Bharti, Assistant Professor - Internal Member
6. Dr. Sandeep Vaishnav, Head & Assistant Professor - Convener

Dr. Sandeep Vaishnav (Head, Department of Physiotherapy) warmly welcomed all the board members. The Head also valued the participation of outside specialists who traveled far and wide to attend this gathering.

Agenda 1: Introduction of New Programmes/Course

Resolution: As per suggestions received from the members of the BOS committee, a new programme BPT (Bachelor in Physiotherapy) was introduced in the upcoming session 2018-19 The detailed syllabus and scheme are attached as **Annexure 2.**

Agenda 2: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHYSIOTHERAPY

DATE: 13 Sept 2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Dr R.K Paliwal (Dean Academics)	Chairman	
2	Dr. Ajeet Kumar Saharan (Principal, Jaipur Physiotherapy College)	External Member	13/7/18
3	Dr. Shekhar Singh (Asst. Professor, Jaipur Physiotherapy College)	External Member	
4	Ms. Jaya Bharti H.O.D of Paramedical, Asst. Professor	Internal Member	13/9/18
5	Ms. Shanti Nath Asst. Professor	Internal Member	
6	Dr. Sandeep Vaishnav H.O.D	Convener	13/9/18

Suggestions by External Expert 1

Suggestions by External Expert 2

SCHEME OF EXAMINATION
&
CURRICULUM
FOR
BACHELOR OF PHYSIOTHERAPY- B.P.T

(FIRST THROUGH FOURTH YEAR)

+

(INTERNSHIP OF SIX MONTHS)

Mewar University
Knowledge to wisdom

MEWAR UNIVERSITY

NH-79 Gangrar, Chittorgarh, Rajasthan 312901.

Index of Syllabus
BPT 1st Year

Course	Year	Current Sub. Code	Subjects	Theory Paper (SAQ (56)+MCQ (14)	Viva-Voce	Int. Assmnt	Practical	Practical Int. Assmnt.	Grand Total
BPT	1st Year	BPT-101	1. Human Anatomy	70	10	20	80	20	200
BPT	1st Year	BPT-102	2. Exercise Therapy-I Yoga, & Massage	70	10	20	80	20	200
BPT	1st Year	BPT-103	3. Electro Therapy & Actinotherapy	70	10	20	80	20	200
BPT	1st Year	BPT-104	4. Human Physiology	70	10	20	80	20	200
BPT	1st Year	BPT-105	5. Basic Physiotherapy	70	10	20			100
BPT	1st Year	BPT-106	6. Basic Nursing & Computer Application	70	10	20			100
BPT	1st Year	BPT-107	7. Biochemistry	70	10	20			100
BPT	1st Year	ELGA-108	8. English Language & General awareness-I	25					25

BPT- 2nd Year

BPT	2nd Year	BPT-201	1. Psychology & Sociology	70	10	20			100
BPT	2nd Year	BPT-202	2. Exercise therapy- 2	70	10	20	80	20	200
BPT	2nd Year	BPT-203	3. Biomechanics & Kinesiology	70	10	20	80	20	200
BPT	2nd Year	BPT-204	4. Pathology & Microbiology	70	10	20			100
BPT	2nd Year	BPT-205	5. Pharmacology	70	10	20			100
BPT	2nd Year	ELGA-206	6.Basic English & General Awareness-II	25					25

BPT- 3rd Year

BPT	3rd Year	BPT-301	1. Clinical Orthopaedics	70	10	20			100
BPT	3rd Year	BPT-302	2. Clinical Neurology, Psychiatry	70	10	20			100
BPT	3rd Year	BPT-303	3. General Medicine, Skin & Paediatrics	70	10	20			100
BPT	3rd Year	BPT-304	4. General Surgery, Obst. & Gynae., ENT & Ophthalmology	70	10	20			100
BPT	3rd Year	BPT-305	5. Disability, Prevention Rehabilitation	70	10	20	80	20	200
BPT	3rd Year	ELGA-306	6. English Language & General Awareness-III	25					25

BPT 4th - Year

BPT	4th Year	BPT-401	1. Physiotherapy in Othopaedics	70	10	20	80	20	200
BPT	4th Year	BPT-402	2. Physiotherapy in Neurology	70	10	20	80	20	200
BPT	4th Year	BPT-403	3. Physiotherapy in general & Cardiothoracic Conditions	70	10	20	80	20	200
BPT	4th Year	BPT-404	4. Physiotherapy in Sports	70	10	20	80	20	200
BPT	4th Year	BPT-405	5. Research Methodology & Biostatistics	70	10	20			100
BPT	4th Year	BPT-406	6. Project Work		100		100		200
BPT	4th Year	BPT-407	6 Month Internship		200		100	100	400

MEWAR UNIVERSITY * Chittorgarh - 312001 (Raj) *

Course of study

(TEACHING HOURS) BPT- Ist Year

Sr.No.	Subject	Theory	Practicals	Total	G. Total
1.	Anatomy	160	160	320	
2.	Exercise Therapy-1	80	120	200	
3.	Electrotherapy	120	200	320	
4.	Physiology	160	80	240	
5.	Basic Physiotherapy	100		100	
6.	Basic Nursing & Computer	80		80	
7.	Biochemistry	100		100	
8.	English Language & General Awareness-I	50			1410

BPT- 2nd Year

Sr.No.	Subject	Theory	Practicals	Total	G. Total
1.	Psychology & Sociology	160		160	
2.	Exercise Therapy-2	80	120	200	
3.	Biomechanics & Kinesiology	160	160	320	
4.	Pathology & Microbiology	120		120	
5.	Pharmacology	120		120	
6.	English Language & General Awareness-II	80		80	1000

BPT-3rd Year

Sr.No.	Subject	Theory	Practicals	Total	G. Total
1.	Clinical Orthopaedics	100		100	
2.	Clinical Neurology, Psychiatry	150		150	
3.	General Medicine, Skin & Paediatrics	200		200	
4.	General Surgery, Obst. & Gynae., ENT & Ophthalmology	200		200	
5.	Disability, Prevention Rehabilitation	120	80	200	
6.	English Language & General Awareness-III	80		80	930

BPT- 4th Year

Sr.No.	Subject	Theory	Practicals	Total	G. Total
1.	Physiotherapy in Orthopaedics	160	180	340	
2.	Physiotherapy in Neurology	160	180	340	
3.	Physiotherapy in general & Cardiothoracic Conditions	160	140	300	
4.	Physiotherapy in Sports	140	140	280	
5.	Research Methodology & Biostatistics	80		80	
6.	Project Work		200	200	1540

INTERNSHIP	1260	1260
TOTAL CURRICULAR HOURS		6140

Contents of BPT

Course	Year	Current Sub Code	Subjects
BPT	1st Year	BPT-101	1. Human Anatomy
BPT	1st Year	BPT-102	2. Exercise Therapy-1, Yoga & Massage
BPT	1st Year	BPT-103	3. Electro Therapy & Actinotherapy
BPT	1st Year	BPT-104	4. Human Physiology
BPT	1st Year	BPT-105	5. Basic Physiotherapy
BPT	1st Year	BPT-106	6. Basic Nursing & Computer Application
BPT	1st Year	BPT-107	7. BIOCHEMISTRY
BPT	1st Year	ELGA-108	8. English Language & General Awareness-I
BPT	2nd Year	BPT-201	1. Psychology & Sociology
BPT	2nd Year	BPT -202	2. EXERCISE THERAPY- 2
BPT	2nd Year	BPT-203	3. Biomechanics & Kinesiology
BPT	2nd Year	BPT-204	4. Pathology & Microbiology
BPT	2nd Year	BPT-205	5. Pharmacology
BPT	2nd Year	ELGA-206	6.English Language & General Awareness-II
BPT	3rd Year	BPT-301	1. Clinical Orthopaedics
BPT	3rd Year	BPT-302	2. Clinical Neurology, Psychiatry
BPT	3rd Year	BPT-303	3. General Medicine, Skin & Paediatrics
BPT	3rd Year	BPT-304	4. General Surgery, Obst. & Gynae., ENT & Ophthalmology
BPT	3rd Year	BPT-305	5. Disability, Prevention Rehabilitation
BPT	3rd Year	ELGA- 306	6. English Language & General Awareness-III
BPT	4th Year	BPT-401	1. Physiotherapy in Othopaedics
BPT	4th Year	BPT-402	2. Physiotherapy in Neurology
BPT	4th Year	BPT-403	3. Physiotherapy in general & Cardiothoracic Conditions
BPT	4th Year	BPT-404	4. Physiotherapy in Sports
BPT	4th Year	BPT-405	5. Research Methodology & Biostatistics
BPT	4th Year	BPT-406	6. Project Work
			6 Month Internship

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/705-A **4th June 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Physics

The Board of Studies for the Department of Physics reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology - Chairman
2) Dr. S.C. Tiwari, Associate Professor, M L V Govt. College, Bhilwara - External Member
3) Ms. Madhuri Jariya, Assistant Professor - Internal Member
4) Mr. Pramod Mehta, Assistant Professor - Internal Member
5) Mr. Narayan Lal - Alumni
6) Dr. Gulzar Ahmed, Head, Assistant Professor -Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the third week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHYSICS

DATE: 18.06.2018

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Physics under the Faculty of Science and Technology was held on 18th June 2018 in Room No. 135 at 10:00 am onwards to approve the new curriculum and Syllabus for session 2018-19.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology - Chairman
2) Dr. S.C. Tiwari, Associate Professor, M L V Govt. College, Bhilwara - External Member
3) Ms. Madhuri Jariya, Assistant Professor - Internal Member
4) Mr. Pramod Mehta, Assistant Professor - Internal Member
5) Mr. Narayan Lal - Alumni
6) Dr. Gulzar Ahmed, Head, Assistant Professor -Convener

Dr. Gulzar Ahmed, (Head, Dept. of Physics) warmly welcomed all the board members. Dr. Ahmed introduced the external member. The following items were resolved in the meeting.

Agenda 1: To approve minutes of the previous BOS, held on 27-06-2017

Resolution: Minutes of the previous BOS of the Physics Department held on 27-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. Gulzar Ahmed, (Head, Physics Department) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development, and Industrial collaboration.

Agenda 3: Approval of Existing Programmes/Courses

Resolution: The Committee reviewed the scheme and syllabus of the M.Sc Physics programme and approved the same scheme and syllabus for the session 2018-19. **(Annexure 2)**

Agenda 4: To recommend the approved syllabus to Academic Council

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PHYSICS

DATE: 18.06.2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology	Chairman	
2	Dr. S.C. Tiwari, Associate Professor, M L V Govt. College, Bhilwara	External Member	
3	Mr. Pramod Mehta, Assistant Professor	Internal Member	
4	Ms. Madhuri Jariya Assistant Professor, Physics.	Internal Member	
5	Mr. Narayan lal	Alumni	18/6/18
6	Dr. Gulzar Ahmed Head & Assistant Professor	Convener	18/6/2018
		Special Invitee (if any)	

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/704-A **04th June 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Chemistry

The Board of Studies for the Department of Chemistry is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology -Chairman
2. Dr. B.V. Kabra, HOD Chemistry, MLV, Govt. College Bhilwara - External Member
3. Mr.Giriraj Tailor, Assistant Professor, Chemistry - Internal Member
4. Ms. Sunita Sharma, Assistant Professor, Chemistry - Internal Member
5. Mr. Anil Jaiswal - Alumni
6. Dr. Bhupendra Kumar Sarma, Head & Assistant Professor -Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the third week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

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- PS to Hon'ble President (for kind information)
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- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CHEMISTRY

DATE: 18.06.2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Chemistry meeting held on 18-06-2018 at 12.30 PM.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology	-Chairman
2. Dr. B.V. Kabra, HOD Chemistry, MLV, Govt. College Bhilwara	- External Member
3. Mr.Giriraj Tailor, Assistant Professor	- Internal Member
4. Ms. Sunita Sharma, Assistant Professor	- Internal Member
5. Mr. Anil Jaiswal	- Alumni
6. Dr. Bhupendra Kumar Sharma, Head, Chemistry	-Convener

At the outset, Dr. Bhupendra Kumar Sharma, Head of the Department of Chemistry, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 13-06-2017

Resolution: Minutes of the previous BOS of the Chemistry Department held on 13-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. Bhupendra Kumar Sarma (Head of, Department of Chemistry) presented the annual report of the department.

Agenda 3: Review of Existing Programmes/Courses

Resolution: The committee reviewed and approved the Syllabus of M.Sc. Programme. **(Annexures 2)**

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Agenda 4: Introduction of New Programmes/ Course

Resolution:

- Introduces Value added course Water analysis and soil constituents measurement of 30 Hours in Academic session 2018-19. **(Annexure 3)**
- As per the suggestions received from the member of the previous BOS committee, it is decided to start two new courses in B.Sc. Chemistry (Honors) from the upcoming session 2018-19. **(Annexure 4)**
    a. Analytical Methods in Chemistry
    b. Instrumental method for chemical analysis
- As per the suggestions received from the member of the previous BOS committee, it is decided to start one new course in M.Sc Organic Chemistry in the upcoming session 2018-19. **(Annexure 5)**
    a. Pharmaceutical Chemistry

Agenda 5:To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

BKH

MEWAR UNIVERSITY * Chittorgarh - 312901 (Raj.) *

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CHEMISTRY

DATE: 18.06.2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology	Chairman	18/06/2018
2	Dr. B.V. Kabra, HOD Chemistry, MLV, Govt. College Bhilwara	External Member	B.V. Kabra 18/6/2018
3	Mr. Giriraj Tailor, Assistant Professor, Chemistry	Internal Member	Tailor 18/6/18
4	Ms. Sunita Sharma, Assistant Professor, Chemistry	Internal Member	18/6/18
5	Mr. Anil Jaiswal	Alumni	Anil 18-6-18
6	Dr. Bhupendra Kumar Sarma, HOD, Chemistry	Convener	Bk Sarma 18/6/18
		Special Invitee (if any)	

ANALYTICAL METHODS IN CHEMISTRY [Credits: 4]

Unit-1

Optical methods of analysis: Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law. UV-Visible Spectrometry: Basic principles of instrumentation (choice of source, monochromator and detector) for single and double beam instrument with details of molecular analysis by UV-Visible Spectrometry:

Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator & detector) for single and double beam instrument; sampling techniques. Structural illustration through interpretation of data, Effect and importance of isotope substitution.

Unit-2

Thermal methods of analysis: Theory of thermogravimetry (TG), basic principle of instrumentation. Techniques for quantitative estimation of Ca and Mg from their mixture.

Electro analytical methods: Classification of electro analytical methods, basic principle of pH metric, potentiometric and conductometric titrations.

Unit-3

Separation techniques: Solvent extraction: Classification, principle and efficiency of the technique. Mechanism of extraction: extraction by solvation and chelation. extraction of organic species from the aqueous and nonaqueous media. Chromatography: Classification, principle and efficiency of the technique. Mechanism of separation: adsorption, partition & ion exchange.

Reference Books:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6 th Ed.,Pearson, 2009.
2. Willard, H.H. et al.: Instrumental Methods of Analysis, 7th Ed. Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Christian, G.D. Analytical Chemistry, 6 th Ed. John Wiley & Sons, New York, 2004.
4. Harris, D.C.: Exploring Chemical Analysis, 9th Ed. New York, W.H. Freeman, 2016.

INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS [Credits: 4]

Unit-1

Introduction to spectroscopic methods of analysis: Treatment of analytical data, including error analysis. Classification of analytical methods and the types of instrumental methods. Consideration of electromagnetic radiation.

Infrared spectroscopy: Interactions with molecules: absorption and scattering. Means of excitation (light sources), separation of spectrum (wavelength dispersion, time resolution), detection of the signal (heat, differential detection), interpretation of spectrum (qualitative, mixtures, resolution), advantages of Fourier Transform (FTIR). Samples and results expected. Applications: Issues of quality assurance and quality control, Special problems for portable instrumentation and rapid detection.

Unit-2

Mass spectroscopy: Making the gaseous molecule into an ion (electron impact, chemical ionization), Making liquids and solids into ions (electrospray, electrical discharge, laser desorption, fast atom bombardment), Separation of ions on basis of mass to charge ratio, Magnetic, Time of flight, Electric quadrupole. Resolution, time and multiple separations, Detection and interpretation (how this is linked to excitation).

Atomic spectroscopy: Atomic absorption, Atomic emission, and Atomic fluorescence. Excitation and getting sample into gas phase (flames, electrical discharges, plasmas), Wavelength separation and resolution (dependence on technique), Detection of radiation (simultaneous/scanning, signal noise), Interpretation (errors due to molecular and ionic species, matrix effects, other interferences).

Unit-3

NMR spectroscopy: Principle, Instrumentation, Factors affecting chemical shift, Spin-coupling, Applications. Electroanalytical Methods: Potentiometry & Voltammetry, Radiochemical Methods. X-ray analysis and electron spectroscopy (surface analysis)

Reference books:

1. Skoog, D.A. Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage Learning India Ed.
2. Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. Instrumental Methods of Analysis, 7Th Ed. Wadsworth Publishing Company Ltd., Belmont, California, USA, 1988.
3. P.W. Atkins: Physical Chemistry.

PHARMACEUTICAL CHEMISTRY (CYMS-303-3, Credit-4)

Unit-I

Carbohydrates: Classification and properties of food carbohydrates, General methods of analysis of food carbohydrates,

Proteins: Chemistry and classification of amino acids and proteins, Physico-Chemical properties of protein and their structure, general methods of analysis of proteins and amino acids

Unit-II

Lipids: Classification, general methods of analysis, refining of fats and oils; hydrogenation of vegetable oils, Determination of adulteration in fats and oils

Vitamins: Classification of vitamins, methods of analysis of vitamins, Principles of microbial assay of vitamins of B-series

Unit-III

Definition, classification and principles and procedures involved in the quantitative determination of drugs from each category of both API and dosage forms (IP) of the following:

a. Analgesics & Antipyretics
b. Antihypertensives
c. Antihistamines
d. Alkaloids
e. Antibiotics
f. Diuretics

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/798-A **28th June 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Agriculture

The Board of Studies for the Department of Agriculture is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) R C Tiwari, Dean, Faculty of Agri. & Vet. Sc.	- Chairman
2. Prof. (Dr.) G S Sharma, Ex. Dean RCA, MPUAT, Udaipur	- External Member
3. Prof. (Dr.) A K Mehta Director Research, MPUAT, Udaipur.	- External Member
4. Prof. (Dr.) K N Nagaich, Professor, DDI, RVSKVV, Gwalior	- External Member
5. Mr. Brijesh Kumar Meena, Assistant Professor, Agriculture	- Internal Member
6. Mr. K K Bhati, Associate Professor, Agriculture	-Internal Member
7. Dr.Neelu Jain, Associate Professor, Agriculture	-Internal Member
8. Mr. Madho Singh, Assistant Professor, Agricultur	-Internal Member
9. Mr. Vishnu Dhaker, Field staff, Biostadt India Limited	- Alumni
10. Mr. Gautam Singh Dhaked, Head, Agriculture	- Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the first week of July 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University..

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
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- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF AGRICULTURE

DATE: 6.07.2018

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Agriculture meeting held on 06-07-2018 at 11.30 AM. The following members were present: **(Annexure 1)**

1. Prof. (Dr.) R C Tiwari, Dean, Faculty of Agri. & Vet. Sc.	- Chairman
2. Prof. (Dr.) G S Sharma, Ex. Dean RCA, MPUAT, Udaipur	- External Member
3. Prof. (Dr.) A K Mehta Director Research, MPUAT, Udaipur.	- External Member
4. Prof. (Dr.) K N Nagaich, Professor, DDI, RVSKVV, Gwalior	- External Member
5. Mr. Brijesh Kumar Meena, Assistant Professor, Agriculture	- Internal Member
6. Mr. K K Bhati, Associate Professor, Agriculture	-Internal Member
7. Dr.Neelu Jain, Associate Professor, Agriculture	-Internal Member
8. Mr. Madho Singh, Assistant Professor, Agriculture	-Internal Member
9. Mr. Vishnu Dhaker, Field staff, Biostadt India Limited	- Alumni
10. Mr. Gautam Singh Dhaked, Head, Agriculture	- Convener

At the outset, Mr. Gautam Singh Dhaked, Head of the Department of Agriculture, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 07-06-2017
Resolution: Minutes of the previous BOS of the Agriculture department held on 07-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Mr. Gautam Singh Dhaked (Head, Agriculture) presented a departmental activity report to BOS committee.

Agenda 3: Propose to review of present course structure and syllabus for B.Sc. Agriculture.

Resolution: Finally, the board of studies resolved that the course content of the B.Sc. Agriculture be reviewed and necessary changes, if required within the prescribed limit (15-20%) of the ICAR be made and presented for consideration of BOS next time.

Agenda 4: To recommend the approved syllabus to Academic Council.
Resolution: Members of the Board of Studies approved the syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF AGRICULTURE

DATE: 6.07.2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) R C Tiwari, Dean, Faculty of Agri. & Vet. Sc.	Chairman	
2	Prof. (Dr.) G S Sharma, Ex. Dean RCA, MPUAT, Udaipur	External Member	6/07/2018
3	Prof. (Dr.) A K Mehta Director Research, MPUAT, Udaipur.	External Member	
4	Prof. (Dr.) K N Nagaich, Professor, DDI, RVSKVV, gwalior	External Member	
5	Mr. Brijesh Kumar Meena, Assistant Professor, Agriculture	Internal Member	06/07/2018
6	Mr. K K Bhati Asso. Professor, Agriculture	Internal Member	
7	Mr. Madho Singh, Assistant Professor, Agriculture	Internal Member	6/7/2018
8	Mr. Vishnu Dhaker, Field staff, Biostadt India Limited	Alumni	06-7-2018
9	Mr. Gautam Singh Dhaked, Head, Agriculture	Convener	6/7/18
		Special Invitee (if any)	

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No. MU/RO/2018/567-A **11th May 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Sociology

The Board of Studies for the Department of Sociology is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) Chitralekha Singh, Dean, Faculty of Humanity, Social Science & Fine Art - Chairman
2) Prof. (Dr.) Pooran Mal Yadav, MLS University, Udaipur. - External Member
3) Prof. (Dr.) Piyush Kumar Sharma, M.P. Govt. P.G. College, Chittorgarh - External Member
4) Dr. Durga prasad, Assistant Professor. - Internal Member
5) Mr. Manoj Kumar Yadav, Assistant Professor, - Internal Member
6) Dr. Ravindra kumar, Assistant Professor & Head - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the Second week of June 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
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- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF SOCIOLOGY

DATE: 08/06/2018

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Sociology was held on 08th June 2018 in Room No. 135 at 11:00 am onwards to approve the new curriculum and syllabus for session 2018-19.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) Chitralekha Singh, Dean, Faculty of Humanity, Social Science & Fine Art - Chairman
2) Prof. (Dr.) Pooran Mal Yadav, MLS University, Udaipur. - External Member
3) Prof. (Dr.) Piyush Kumar Sharma, M.P. Govt. P.G. College, Chittorgarh - External Member
4) Dr. Durga prasad, Assistant Professor. - Internal Member
5) Mr. Manoj Kumar Yadav, Assistant Professor, - Internal Member
6) Dr. Ravindra kumar, Assistant Professor & Head - Convener

At the outset, Dr. Ravindra Kumar (Head, Department of Sociology) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: Introduction of New Programmes/Course

Resolution: The BOS committee members decided that a new programme M.A. Sociology will be started in the upcoming session 2018-19. The detailed syllabus and scheme are enclosed here as **(Annexure 2)**

- M.A. Sociology

Agenda 2: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

Ravindra kumar

MEWAR UNIVERSITY * Chittorgarh - 312901 (Raj.) *

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF SOCIOLOGY

DATE: 08/06/2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) Chitralekha Singh; Dean, Faculty of Humanities, Social Sciences & Fine Arts,	Chairman	08.06.2018
2	Prof. (Dr.) Pooran Mal Yadav, Professor/Head, Department of Sociology, Mohanlal Sukhadia University, Udaipur	External Member	08/06/2018
3	Prof. (Dr.) Piyush Kumar Sharma, Professor/Head, Department of Sociology, M.P. Govt. P.G. College, Chittorgarh	External Member	
4	Dr. Durga prasad, Assistant Professor,	Internal Member	
5	Mr. Manoj Kumar Yadav, Assistant Professor,	Internal Member	Myadav 8/6/18
6	Dr. Ravindra Kumar, (Convenor) Assistant Professor & Head,	Convener	8/6/18

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No. MU/RO/2018/ 1029-A **07th August 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Psychology

The Board of Studies for the Department of Psychology is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Dr. Amresh kumar, Dean, Faculty of Education and Psychology - Chairman
2) Dr. Ravindra kumar, HoD & Assistant Professor. - Convener
3) Prof. (Dr.) Meenakshi Bhatnagar, SMM, Girls College, Bhilwara - External Member
4) Prof. Sushila Pareek, University of Rajasthan - External Member
5) Dr. Chander Kant Sharma, Assistant Professor - Internal Member
6) Mrs. Vandana Chundawat, Assistant Professor - Internal Member

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the second week of September 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PSYCHOLOGY

DATE: 08/09/2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Psychology was held on 08th September 2018 in Room No. 135 at 11:00 am onwards to approve the new/changes in curriculum and syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1) Dr. Amresh kumar, Dean, Faculty of Education and Psychology - Chairman
2) Dr. Ravindra kumar, HoD & Assistant Professor. - Convener
3) Prof. (Dr.) Meenakshi Bhatnagar, SMM, Girls College, Bhilwara - External Member
4) Prof. Sushila Pareek, University of Rajasthan - External Member
5) Dr. Chander Kant Sharma, Assistant Professor - Internal Member
6) Mrs. Vandana Chundawat, Assistant Professor - Internal Memberr

At the outset, Dr. Ravindra Kumar (Head, Department of Psychology) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 17-12-2016

Resolution: Minutes of the previous BOS of the Psychology department held on 17-12-2016 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. Ravindra Kumar (Head, Department of Psychology) presented a departmental activity report mentioning all the activities conducted related to curricular development, research development, and faculty development.

Agenda 3: Review of any program/course

Resolution: The Committee reviewed the scheme and syllabus of M.A. Psychology and approved the scheme and syllabus for the session 2018-19. **(Annexure 2)**

Ravindra kumar

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Agenda 4: Any other suggestions by BOS Committee

Resolution:

- To add relevant papers to the syllabus of the M.A Psychology program.
- The inclusion of a few latest reference books and the removal of a few old reference books from the syllabus were also emphasized.

Agenda 5: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

Ravinder Kumar

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Dr. Amresh kumar, Dean , Faculty of Education & Psychology, Mewar Universit	Chairman	8/9/2018
2	Prof. Sushila Pareek, Member (External) Associate Professor, Department of Psychology, University of Rajasthan, Jaipur (Rajasthan)	External Member	8/9/2018
3	Prof. (Dr.) Meenakshi Bhatnagar, *SMM, Girls, College, Bhilwara*	External Member	
4	Dr. Chander Kant Sharma, Assistant Professor, Mewar University Mewar University, Gangrar, Chittorgarh (Rajasthan) 312901	Internal Member	08/09/2018
5	Ms. Vandana Chundawat *ment*, Mewar University Mewar University, Gangrar, Chittorgarh (Rajasthan) 312901	Internal Member	
6	Ms. Shriti Gupta	Alumni	
7	Dr. Ravindra Kumar, (Convenor) Assistant Professor & Head,	Convener	08.09.2018

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/ 320 **22nd March 2018**

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for the Department of Humanities

The Board of Studies for the Department of Humanities is reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1) Prof. (Dr.) Chitralekha Singh, Dean, Faculty of Humanities, Social Science & Fine Arts - Chairman
2) Prof. (Dr.) Shushila Laddha, Maharana Pratap Government PG College, Chittorgarh - External Member
3) Prof. (Dr.) Hemraj Meena,kendriya Hindi Sansthan Aagra (UP) - External Member
4) Dr. Mahesh Chandra Dubey, Assistant Professor - Internal Member
5) Mrs. Manju Chashta, Assistant Professor - Internal Member
6) Dr. Prashant Singh Rathore, Assistant Professor & Head - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.
The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.
The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman in the second week of April 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.
The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoDs (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF HUMANITIES

Date: 13/04/2018

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Humanities was held on 13th April 2018 in Room No. 135 at 11:00 am onwards to approve the curriculum and syllabus for session 2018-19.

The following members were present: **(Annexure 1)**

1) Prof. (Dr.) Chitralekha Singh, Dean, Faculty of Humanities, Social Science & Fine Arts - Chairman
2) Prof. (Dr.) Shushila Laddha, Maharana Pratap Government PG College, Chittorgarh - External Member
3) Prof. (Dr.) Hemraj Meena, Kendriya Hindi Sansthan Aagra (UP) - External Member
4) Dr. Mahesh Chandra Dubey, Assistant Professor - Internal Member
5) Mrs. Manju Chashta, Assistant Professor - Internal Member
6) Dr. Prashant Singh Rathore, Assistant Professor & Head - Convener

At the outset, Dr. Prashant Singh Rathore (Head, Department of Humanities) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: Introduction of New Programme/Courses to be added.

Resolution: As per the recommendation of the members of the BOS committee, it has been decided to start a new programme Master in Performing Arts (MPA) in the upcoming session 2018-19. The detailed syllabus and scheme are enclosed as **(Annexure 2)**

- Master in Performing Arts (MPA)

Agenda 2: To recommend the approved syllabus to Academic Council

Resolution: Members of the Board of Studies approved the syllabus and recommended the same to be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF HUMANITIES

Date: 13/04/2018

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) Chitraleka, Dean, Faculty of Humanities, Social Science & Fine Arts	Chairman	13.04.2018
2	Dr. Shushila Laddha, Professor, Mharana Pratap Government College, Chittourgharh	External Member	
3	Prof. Hemraj Meena,kendriya Hindi Sansthan Aagra(UP)	External Member	
4	Dr. Mahesh Chandra Dubey, Assistant Professor	Internal Member	
5	Manju Chashta, Assistant Professor	Internal Member	13.4.18
6	Dr. Prashant Singh Rathore, Assistant Professor & Head	Convener	13-4-18

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2018/ 563-A

10th May 2018

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Life Science

The Board of Studies for the Department of Life Science reconstituted as per Rule 12 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology - Chairman
2. Dr. P. J. John, Associate Professor, Dept. of Zoology, UOR, Jaipur - External Member
3. Dr. Farah Syed, Assistant Professor, Dept. of Zoology, UOR, Jaipur - External Member
4. Ms. Nalini Tomer, Assistant Professor - Internal Member
5. Mr. Rizwan Ahmad, Assistant Professor - Internal Member
6. Ms. Divya Puri Goswami - Alumni
7. Prof. (Dr.) Chetan Kumar Sharma, Professor & Head - Convener

The terms of reference for the Board of Studies are as provided in Rule 12 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman in the fourth week of May 2018. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Registrar

Registrar
Mewar University
Gangrar, (Chittorgarh)

Copy to:

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- PS to Hon'ble Pro-President (for kind information)
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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF LIFE SCIENCE

DATE: 22.05.2018

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Life Science, Faculty of Science and Technology was held on 22nd May 2018 in Room No. 135 at 10:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2018-19.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) R. K. Paliwal, Dean, Faculty of Science & Technology	- Chairman
2. Dr. P. J. John, Associate Professor, Dept. of Zoology, UOR, Jaipur	- External Member
3. Dr. Farah Syed, Assistant Professor, Dept. of Zoology, UOR, Jaipur	- External Member
4. Ms. Nalini Tomer, Assistant Professor	- Internal Member
5. Mr. Rizwan Ahmad, Assistant Professor	- Internal Member
6. Ms. Divya Puri Goswami	- Alumni
7. Prof. (Dr.) Chetan Kumar Sharma, Professor & Head	- Convener

At the outset, Prof. (Dr.) Chetan Kumar Sharma, Head of the Department of Life Science, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 13-06-2017

Resolution: Minutes of the previous BOS of the Life Science Department held on 13-06-2017 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Prof. (Dr.) Chetan Kumar Sharma, (Head, Life Science Department) presented annual report of the department.

Agenda 3: Review of Existing Programmes/ Courses

Resolution: The Committee reviewed and approved the scheme and syllabus of courses for B.Sc-BCZ, B.Sc-Biotechnology, M.Sc Botany and M.Sc Zoology students for the upcoming session from 2018-19.

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Agenda 4: Introduction of New Programmes/Course

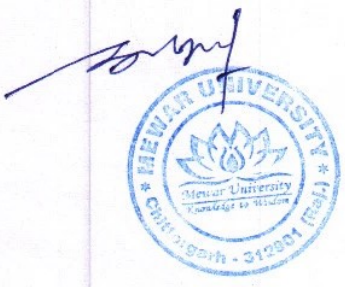
Resolution:

1. The suggestion received from previous BOS committee members a new programme M.Sc Microbiology will be started in the upcoming session 2018-19. A listing of practical and marks distribution (scheme of practical) should be done and appended with the syllabus. **(Annexure 3)**
   - M.Sc – Microbiology
2. The BOS Committee approved the syllabus of two new courses in B.Sc BCZ of Zoology from session 2018-19 is mentioned below. **(Annexure 4)**
   - Animal Genetics
   - Animal Evolutionary Biology
3. The BOS Committee approved the syllabus of one new course in B.Sc Biotechnology from session 2018-19 is mentioned below. **(Annexure 5)**
   - Biophysics
4. As per the recommendation of the previous BOS committee, it has been decided to add three new courses in the M.Sc Environmental Science from the upcoming session 2018-19. The courses are mentioned below. **(Annexure 6)**
   - Urban ecosystems
   - Environmental pollution and human health
   - Land and soil conservation and management
7. As per the recommendation of the previous BOS committee, it has been decided to add two new courses in the M.Sc Botany programme from the upcoming session 2018-19. The courses are mentioned below. **(Annexure 7)**
   - Evolutionary Biology
   - Genetics and Cytogenetics

Agenda 5: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.



Department of Life Science
(Microbiology)

Syllabus & Detailed Scheme

of

M.Sc. Microbiology (2 years)

{2018-19}

Mewar University

Knowledge to Wisdom

DEPARTMENT OF LIFESCIENCE
(MICROBIOLOGY)
FACULTY OF SCIENCE AND TECHNOLOGY
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Mewar University, Chittorgarh
Year: 2018-19
PG Course-M.Sc. Microbiology

Core Course

Sr. No.	Type of Course	Semester	Course code	Title of the Course
1	Core Course 1	I	M1MB-CT01	Instrumentation and Analytical Techniques
2	Core Course 2	I	M1MB-CT02	Fundamentals of Microbiology
3	Core Course 3	I	M1MB-CT03	Cell Biology and Molecular Genetics
4	Core Course 4	I	M1MB-CT04	Biochemistry
5	Core Course 5	II	M2MB-CT05	Genetic Engineering
6	Core Course 6	II	M2MB-CT06	Fermentation Technology
7	Core Course 7	II	M2MB-CT07	Molecular Biology
8	Core Course 8	II	M2MB-CT08	Bioinformatics
9	Core Course 9	III	M3MB-CT09	Microbial Physiology and Metabolism
10	Core Course 10	III	M3MB-CT10	Virology

Core Course Practical

Sr. No.	Type of Course	Semester	Course code	Title of the Course
1	Core Course Practical 1	I	M1MB-CP01	Core Practical-1 (Instrumentation and Analytical Techniques + fundamentals of Microbiology)
2	Core Course Practical 2	I	M1MB-CP02	Core Practical-2 (Cell Biology and Molecular Genetics + Biochemistry)
3	Core Course Practical 3	II	M2MB-CP03	Core Practical-3 (Genetic Engineering + Fermentation Technology)
4	Core Course Practical 4	II	M2MB-CP04	Core Practical-4 (Molecular Biology + Bioinformatics)
5	Core Course Practical 5	III	M3MB-CP04	Core Practical-5 (Microbial Physiology and Metabolism + Virology)

Skill Enhancement Course Elective

Sr. No.	Type of Course	Semester	Course code	Title of the Course	
1	Skill Course	II	M2MB-SEC01	**Any One**	Techniques of Microbiology
2			M2MB-SEC01		Biostatistics

Discipline Specific Elective

Sr. No.	Type of Course	Semester	Course code	Title of the Course	
1	Discipline Specific Elective 1	III	M3MB- ET01	**Any One**	Microbial Genetics
					Host Parasite Interactions
2	Discipline Specific Elective 2		M3MB- ET01	**Any One**	Microbial Ecology
					Environmental Microbiology
3	Discipline Specific Elective 3	IV	M4MB-ET03	**Any One**	Research Methodology
					Food and Dairy Microbiology
4	Discipline Specific Elective 4		M4MB-ET04	**Any One**	Advances in Microbiology
					Medical Microbiology

Discipline Specific Elective Practical

Sr. No.	Type of Course	Semester	Course code	Title of the Course
1	Discipline Specific Elective Practical 1	III	M3MB-EP01	Based on Choice of DSE
2	Discipline Specific Elective Practical 3	IV	M3MB-EP02	Based on Choice of DSE

Major/Minor Research Project (As per Choice)

Sr. No.	Type of Course	Semester	Course code	Title of the Course
1	Training	IV	M4MB-PJ01	Major Research Project
2	Minor Project	IV	M4MB-PJ02	Minor Research Project (Compulsory)

DEPARTMENT OF LIFESCIENCE (MICROBIOLOGY)
MEWAR UNIVERSITY, GANGRAR (CHITTORGARH)

M.Sc. Microbiology
I Semester
Session 2018-19 onwards

The examination shall consist of four theory papers and two practical

Sr. No.	Paper Code	CC/DSE/ SEC	Title	Credit
1	M1MB-CT01	CC1	Instrumentation and Analytical Techniques	4
2	M1MB-CT02	CC2	Fundamentals of Microbiology	4
3	M1MB-CT03	CC3	Cell Biology and Molecular Genetics	4
4	M1MB-CT04	CC4	Biochemistry	4
5	M1MB-CP01	CC1-PR	Core Practical-1	4
6	M1MB-CP02	CC2-PR	Core Practical-2	4
Total				**24**

Note:
CC - Core Course
PR- Practical

Paper I: CC1 (M1MB-CT01): INSTRUMENTATION AND ANALYTICAL TECHNIQUES (THEORY)

Unit I:

Laboratory instrumentation: principle, components, assembly, working and applications of: Laminar clean air flow bench, autoclave, incubators, weighing balances, pH meter, water bath, hot air oven, colony counter and microtome. Laboratory safety measures.

Unit II:

Aseptic techniques: Principles of sterilization, Brief idea of various methods of sterilization, Physical, chemical, disinfectants, membrane filtration, pasteurization, tyndallization. Definition and classification of compounds used for sterilization, antibiotics and antimicrobials. Evaluation of effectiveness of antimicrobial/antiseptic compounds.

Unit III:

Microscopy: Types, principle, components, working, specimen, preparation and applications of Light, Bright field, Dark field, Phase contrast, Electron (SEM, TEM). Scanning tunneling. Fluorescence, Nomarsky differential interference contrast, Confocal, Atomic force microscopes.

Unit IV:

Chromatography: General Principles, process and applications of Paper and Thin Layer Chromatography. GLC, HPLC, Absorption, Ion Exchange, Gel filtration, Affinity chromatography, Radioactive tracer technique, autoradiography, Gamma and Scintillation
counters, Brief idea of NMR, IR, GC-MS.

UNIT V:

Centrifugation and spectrophotometry: Types of centrifuges. Principles, working and applications of preparative, Analytical, Microcentrifuge. Refrigerated ultracentrifuge. Colorimeter and types of spectrophotometer: principle, working and application.

Electrophoresis: Types, Principles and applications: Gel electrophoresis, SDS PAGE, Affinity electrophoresis.

Suggested Readings

1. Pattabhai, V. and Gautham (2002), N. Biophysics. 2nd edition Narosa pub.
2. Narayan, P. Essentials of Biophysics. New Age International.
3. Roy, R.N. A Text Book of Biophysics. New Central Book Agency.
4. Daniel, M. Basic Biophysics. Agrobios.
5. Rodney Cottegril (2003), Biophysics: an introduction 2nd edition, John wiley & sons publication.

Paper II: CC2 (M1MB-CT02): FUNDAMENTALS OF MICROBIOLOGY (THEORY)

Unit-I

Historical events and contributions of important microbiologists. Kingdom and domain system of classification. Bacterial nomenclature and taxonomy. Numerical taxonomy, Chemotaxonomy, Bergey,s manual of systematic bacteriology. Problems and paradoxes associated with bacterial taxonomy. Evolutionary relationships and phylogeny. Analysis of dendrograms and cladograms.

Unit-II

Archaea, Cyanobacteria, Actinobacteria: Discovery, General characters, classification, morphology, structural organization, reproduction, economic and ecological significance: differences and similarities with bacteria. L forms, Rickettsia, Chlamydia, Spirochaetes, viroids, prions, virusoids: Brief idea of general characteristics, structural organization and significance.

Unit-III

Bacteria: Morphological types. Structure, arrangement and function of flagella and pili. Cell membrane, Cell wall: types, structural organization, significance, Gram staining, Significance of LPS and role in pathogenicity. Nucleoid: organization and significance. Plasmids: properties and types. Important diseases caused by bacteria.

Unit-IV

Virus: Structural organization, classification, multiplication, transmission and significance. Mycoplasma, Spiroplasma and Phytoplasma: General characters, reproduction, transmission and significance. Important diseases caused by viruses, mycoplasma, spiroplasma and phytoplasma.

Unit V

Techniques of microbial culture, Anaerobic culture. Culture media; types, composition, preparation. Selective culture methods, Enrichment culture. Isolation and development of pure culture. Maintaining and preservation of cultures, Enumeration of microbes. Principles of Staining, Nature of dyes and types of staining; Characterization and identification of microbes based on morphology, cultural physiological and biochemical characteristics, serology and molecular methods of identification.

Suggested Readings

1. Tortora GJ, Funke BR, and Case C.L. (2004). Microbiology: An Introduction. 4th edition. Pearson Education.
2. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
3. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education limited.
4. Madigan MT, Martinko JM and Parker J. (2009). Brock Biology of Microorganisms. 12th edition. Pearson/Benjamin Cummings.
5. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.

6. Dubey, R.C. and Maheshwari, D.K. A Text Book of Microbiology. S. Chand and Company.
7. Prescott, H. and Klein. 2000. Microbiology. McGraw Hill

Paper II: CC3 (M1MB-CT03): CELL BIOLOGY AND MOLECULAR GENETICS (THEORY)

Unit I

Structure and organization of cell. Intra-cellular compartmentalization. Structure, function and significance of cell wall, plasma membrane, Membrane proteins and transport across biomembrane. Structure, function and significance of Cell organelles, flagella, cilia, cytoskeleton. Genetic organization of Mitochondria and chloroplast.

Unit II

Nucleus: nuclear membrane, nucleolous and nuclear pore complex. Chromatin; structure, types organization and chemistry of the chromosome. C-value paradox, Nuclear dyes and their application in staining of chromosomes. Karyotyping, Polytene, lambrush and B-chromosomes. Chromosome banding and its staining. Cell cycle events, regulation of cell division: cyclins, cyclin-dependent kinases, inhibitors, control of cell division in multicellular organisms

Unit III

Basic principles of Mendelian genetics- Segregation and Independent assortment, alleles and multiple alleles; human pedigrees and inheritance; Chromosomal basis of inheritance; Gene interactions; Chromosome and its structure; sex determination and sex-linked inheritance; Dosage compensation, Mitochondrial and chloroplast inheritance,

Unit IV

Mutation – molecular basis of spontaneous and induced mutations. Mechanisms of mutagenesis; Assay of mutagenic agents (Ames test); Chromosomal mutations- numerical (trisomy, polyploidy and aneuploidy) and structural changes and detection methods, somatic and germ line mutations, transposable elements, DNA repair, recombination error, SOS response and mutagenic repair.

Unit V

Microbial genetics: Methods of genetic transfers-transformation, conjugation, transduction & sex-duction, mapping genes by interrupted mating, fine structure analysis of genes.

Suggested Readings

1. Alberts, B., Bray, D. Lewis, J., Raff, M., Roberts, K. and Watson, J.D. 1999. Molecular Biology of Cell. Garland Publishing Co. New York, USA.
2. Snustad, D.P. and Simmons, M.J. 2000. Principles of genetics. John Wiley and Sons.
3. Russel, P.J. 1998. Genetics. The Benjamin/Cumming Publishing Co.
4. Gasque, E. Manual of Laboratory experiments in cell Biology. W.C. Wilson Public.
5. Robertis, E.D.P., Robertis, E.M.F. Cell and Molelcular Biology. Sauder College Publication.
6. Beeker, W.M. The world of the cell. Pearson Education.

7. Karp, G. Cell and Molecular Biology. John Willey and sons.
8. Lodish and Baltimore. Molecular Cell Biology. W.H. Freeman and Co.

Paper IV: CC4 (M1MB04CT04): BIOCHEMISTRY (THEORY)

Unit I

Bioenergetics: entropy, enthalpy, Gibbs free energy concept, Laws of thermodynamics. Acids and Bases, redox potential, pH and Buffers, Henderson and Hasselbach equation, pKa, pKb. Preparation of buffers. Electron transport mechanism (chemi-osmotic theroy), Energy rich molecules. Mechanism of ATP synthesis.

Unit II

Carbohydrates: classification, structure, properties and functions. Role of carbohydrates in signaling,glycosylation of other biomolecules. Carbohydrate derivatives: muriens, glycoproteins, glycolipids, peptidoglycan. Carbon fixation, Glycolysis (aerobic and anaerobic), TCA, HMP, PPP and other pathways, Gluconeogenesis, Glycogenesis, Glycogenolysis.

Unit III

Lipids: classification, structure, properties and functions of fatty acids, triacylglycerols, phospholipids, sterols and terpenes, Conjugated lipids - lipoproteins. ketone bodies, Lipids with specific biological functions, micelles and liposomes. Biosynthesis of saturated and unsaturated fatty acids, β-oxidation.

Unit IV

Amino acids: general properties and biosynthesis, Transamination, Deamination, Decarboxylation; glutamine and glutamic acid pathway, urea cycle, uric acid biosynthesis. Protein structure (primary, secondary, tertiary and quaternary). Ramachandran plot. Protein sequencing, Vitamins and Co-enzyme (biological and biochemical functions).

Unit V

Structure and properties of vitamins, co-enzymes, biochemical action of vitamin and watersoluble vitamins, Biosynthesis of vitamins, role of vitamins in the metabolism.

Suggested Readings

1. Voet and Voet. 2000. Biochemistry. John Wiley.
2. Lehninger. 2000. Principles of Biochemistry. CBS Publishers.
3. Stryer, L. 2002. Biochemistry. W.H. Freeman.
4. Harper. 2003. Biochemistry. McGraw-Hill.
5. Zubay. 1995. Biochemistry. Brown Publishers.
6. Jain, J.L. Fundamentals of Biochemistry. S. Chand and Company.
7. Deb, A.C. Fundamental of Biochemistry.
8. Methew, C.K. Biochemistry. Pearson Education.
9. Horton and Moran. Principles & Biochemistry. Prentice Hall

DEPARTMENT OF LIFESCIENCE (MICROBIOLOGY)
MEWAR UNIVERSITY, GANGRAR (CHITTORGARH)

M.Sc. Microbiology
II Semester
Session 2018-19 onwards

The examination shall consist of four theory papers, two practical and one skill enhancement course

S. No.	Paper Code	CC/DSE/ SEC	Title	Credit
1	M2MB-CT05	CC5	Genetic Engineering	4
2	M2MB-CT06	CC6	Fermentation Technology	4
3	M2MB-CT07	CC7	Molecular Biology	4
4	M2MB-CT08	CC8	Bioinformatics	4
5	M2MB-CP03	CC3-PR	Core Practical-3	4
6	M2MB-CP04	CC4-PR	Core Practical-4	4
7	M2MB-SEC01	SEC1	Techniques of Microbiology	2
			Biostatistics	2
Total				**26**

Note:

- CC - Core Course
- PR-Practical
- SEC - Skill Enhancement Course
- Students will opt any one Skill Enhancement Course (SEC) out of given options

Paper I: CC5 (M2MB-CT05): GENETIC ENGINEERING (THEORY)

Unit I

Recombinant DNA Technology: History and Milestones In Genetic Engineering, Application of enzymes in recombinant DNA technology- exo and endonucleases, restriction enzymes, DNA ligases, polymerases, DNA modifying enzymes etc. General concept and principle of cloning: Cloning vectors, classification, plasmids: pBR 322, pBR327, pUC8. Phage vectors: M13 and λ. Phagemids and cosmids.

Unit II

Purification of DNA from living cells- Extraction of bacterial DNA, Plasmid DNA. Isolation of DNA, molecular probes, insertion of DNA into living cell- microinjection, electroporation, shot gun method, ultrasonication, microlaser, uptake of DNA by bacterial cell and introduction of phage DNA in to bacterial cell. Nucleic acid purification, yield analysis.

Unit II

Cloning Methodologies: Methods for construction of genomic and cDNA libraries; Lambda in vitro packaging; Identification and analyses of recombinant DNA clones; Protein-protein interaction and Yeast two hybrid system; Phage display; Ligation free cloning

Unit III

Gene Sequencing: Different methods of gene isolation, techniques for sequencing (Maxam & Gilbert degradation method, Sanger's Dideoxy method), Organo-chemical gene synthesis mechanism, cDNA using reverse transcriptase.

Unit IV

Applications of Genetic Engineering, Genetic engineering in animals: Production and applications of transgenic mice, role of ES cells in gene targeting in mice, Therapeutic products produced by genetic engineering Gene silencing in transgenic plants, Commercially important transgenic plants (Flavr Savr, Bt cotton, Golden rice), rDNA regulations in transgenic plants.

Suggested Readings

1. Gene Cloning and DNA Analysis: An Introduction by T.A. Brown; Wiley-Blackwell.
2. Principles of Gene Manipulation by S.B. Primrose, R.M. Twyman and R.W.Old; Wiley-Blackwell.
3. Molecular Cloning: A Laboratory Manual by J. Sambrook and D.W. Russel; Cold Spring Harbor Laboratory Press.
4. An introduction to genetic engineering by Desmond S. T. Nicholl; Cambridge University Press.

Paper II: CC6 (M2MB-CT06): FERMENTATION TECHNOLOGY (THEORY)

Unit I

Introduction to industrial microbiology and fermentation processes

Brief history and developments in industrial microbiology Types of fermentation processes - Solid-state and liquid-state (stationary and submerged) fermentations; batch, fed-batch (eg. baker's yeast) and continuous fermentations

Unit II

Types of bio-reactors and measurement of fermentation parameters

Components of a typical bio-reactor, Types of bioreactors-Laboratory, pilot- scale and production fermenters, constantly stirred tank and air-lift fermenters, Measurement and control of fermentation parameters - pH, temperature, dissolved oxygen, foaming and aeration

Unit III

Isolation of industrially important microbial strains and fermentation media

Sources of industrially important microbes and methods for their isolation, preservation and maintenance of industrial strains, strain improvement, Crude and synthetic media; molasses, cornsteep liquor, sulphite waste liquor, whey, yeast extract and protein hydrolysates

Unit IV

Down-stream processing

Cell disruption, filtration, centrifugation, solvent extraction, precipitation, lyophilization and spray drying. Microbial production of industrial products (micro-organisms involved, media, fermentation conditions, downstream processing and uses) Citric acid, ethanol, penicillin, glutamic acid, Vitamin B12 Enzymes (amylase, protease, lipase) Wine, beer

Unit V

Enzyme immobilization

Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase)

Suggested Readings

1. Patel A.H. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited
2. Okafor N. (2007). Modern Industrial Microbiology and Biotechnology. 1st edition. Bios Scientific Publishers Limited. USA
3. Waites M.J., Morgan N.L., Rockey J.S. and Higton G. (2001). Industrial Microbiology: An Introduction. 1st edition. Wiley – Blackwell
4. Glaze A.N. and Nikaido H. (1995). Microbial Biotechnology: Fundamentals of Applied Microbiology. 1st edition. W.H. Freeman and Company
5. Casida LE. (1991). Industrial Microbiology. 1st edition. Wiley Eastern Limited.
6. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.

7. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.

Paper III: CC7 (M2MB-CT07): MOLECULAR BIOLOGY (THEORY)

Unit I

Eukaryotic and Prokaryotic genetic materials: Structure, chemical composition, organization, mechanism of replication. Discontinuous synthesis of DNA, RNA primer for DNA synthesis, Enzymes and proteins associated with DNA replication, repetitive DNA. DNA repair: photoreactivation, excision repair, post replication repair, SOS repair.

Unit II

RNA: types, primary, secondary, tertiary and quaternary structure and synthesis.
Transcription: Prokaryotic transcription and RNA polymerase. Eukaryotic transcription and RNA polymerases. Transcription factors and their role. Modification in RNA: 5'-CAP formation, 3'-end processing, Polyadenylation, Splicing, Editing, Nuclear export of mRNA and mRNA stability. Processing of other RNAs, Ribosome formation. Reverse transcription. Inhibitors of RNA synthesis.

Unit III

Translation: Prokaryotic and Eukaryotic translation, mechanism of initiation, elongation & termination, Amino acid activation, Inhibitors, Regulation of translation, Co-& post translation modification of proteins. Protein sorting: synthesis of secretory and membrane proteins, import into nucleus, mitochondria, chloroplast and peroxisomes, Receptor mediated endocytosis.

Unit IV

Regulation of gene expression in prokaryotes and eukaryotes: Transcriptional control; enzyme induction and repression, constitutive synthesis of enzymes. The operon hypothesis: genes involved in regulation- regulatory gene, promoter gene, operator gene and structural gene, role of cAMP and cAMP receptor protein (CRP) in the expression of e.g. Lac operon, Tryptophan operon. Catabolite repression. Cis control elements, promoters, enhancers, Transacting factors,
DNA binding motifs of transcription factors, post transcriptional control.

Unit- V Principles and applications of blotting techniques: Southern, Northern, Western and Eastern blotting. Polymerase chain reaction: Types and applications. Radioactive and non radioactive probes. Autoradiography. DNA fingerprinting, DNA Foot printing and DNA sequencing , Antisense and siRNA technology. Chromosome walking.

Suggested Readings

1. Watson, J.D. Molecular Biology of Gene. Pearson Education.
2. Friefelder, D. Molecular Biology. Narosa Publishing House, New Delhi.
3. Weaver, R. Molecular Biology. McGraw Hill.
crystallization techniques. Commercial applications of enzymes in food, pharmaceutical and other industries.

Paper IV: CC8 (M2MB-CT08): BIOINFORMATICS (THEORY)

Unit I

Introduction to Bioinformatics: Definitions, important contributions, aim and task of bioinformatics.

Unit II

Biological Databases: Sequence databases (EMBL, GenBank, DDBJ, UNIPROT, TrEMBL), Protein family/domain databases (PROSITE, PRINTS, BLOCK, etc), Cluster databases-An Introduction, Specialised databases (KEGG, etc), Database technologies (Flat-file), Structural databases (PDB).

Unit III

Sequence Alignment & Protein structure prediction: Algorithm, goals and type of alignment, study of similarities, scoring mutations, deletions and substitutions, FASTA, BLAST, multiple sequence alignment.

Unit IV

Protein structure prediction: Proteins-prediction strategies, secondary structure prediction, protein prediction program, molecular visualization.

Unit V

Phylogenetic Analysis: Building phylogenetic trees, distance base methods and character bases methods, molecular approaches to phylogeny, phylogenetic analysis databases.

Suggested Readings

1. Rastogi, S.C., Bioinformatics, Concept, Skills & Applications, CBS Publications.
2. Bioinformatics: Databases and Algorithms by N. Gautham; Narosa Publications.
3. Structural Bioinformatics by Bourne P.E. Ed Weissig; H. Wiley-Liss.
4. Bioinformatics for dummies by Claverie Jean M. & Notredame C.; H. Wiley-Liss.
5. Bioinformatics: Sequence and Genome analysis by David W. Mount; CBS Publishers

M.Sc. Microbiology
SEMESTER-II

Skill Enhancement Course-I

Paper V: SEC1 (M2MB-SEC01): TECHNIQUES OF MICROBIOLOGY

Short term skill based programs goal to train all the interested individuals to function as Independent researchers/experts in a multidisciplinary environment of Biotechnology, Forensic Science, and clinical Research.

UNIT I
Sterilization techniques

UNIT II
Preparation of media, Isolation of microorganisms from clinical samples and pure culture techniques

UNIT III
Staining techniques (Grams staining, Negative staining etc.), Determination of total viable count & preparation of growth curves

UNIT IV
Bacterial identification – biochemical tests, Confirmatory tests on selective media.

UNIT V
Enumeration of coliforms in water for human consumption, Antibiotic susceptibility testing, Mutational studies by Replica Plating Technique

Paper V: SEC1 (M2MB-SEC01): BIOSTATISTICS

Unit I
Types & Representation of data: Raw data, grouped data; Representation of data using Bar diagram, Pie diagram, Histogram, polygon.

Unit II
Measures of central tendency and dispersion: Mean, Median, Mode, Mean deviation, Variance & Standard deviation; Probability.

Unit III
Probability: Probability (classical & axiomatic definition of probability, theorem on total and compound probability), Addition & Multiplication theorem of Probability, Random variables & Probability Distribution, Simple problems involving Binomial, Poisson & Normal variables.

Unit IV

Hypothesis testing and parametric tests: Hypothesis-definition, types (One tailed, two tailed), Sampling distribution and errors, Types of errors (Type I, II); Testing of hypothesis (two tailed only); Z-test; t-test; Chi square-test; F-test. Non parametric tests: (Rank sum test, Kruskal Wallis test) Analysis of variance (ANOVA), Correlation and Regression.

Unit V

Methods of sampling: Probability Sampling and Non-probability Sampling methods.

Suggested Readings

1. Zar, J.H. Biostatical Analysis. Pearson Edu.
2. Gupta, S.C. and Kapoor, V.K. Fundamentals of applied statistics. S. Chand and Company.
3. Dutta, N.K. Funadamentals of Biostatistics. Kanika Pub. New Delhi.
4. Arora, P.N. and Malhan, P.K. Biostatistics. Himalya Publishers.
5. Daniel, M. 1999. Biostatistics (3rd Edition). Panima Publishing Corporation.
6. Campbell, R.C. Statistics for Biologist. Cambridge University Press.
7. Introduction to Mathematics for Life Scientists. 3rd edition (1979). Edward Batschalet, Springer.
8. Introductory biostatistics. 1st edition. (2003), Chap T. Le. John Wiley, USA
9. Maths from scratch for biologists by Alan J. Cann; Wiley-Blackwell.
10. Easy Mathematics for Biologists by Peter C. Foster; Hardwood Academic Publisher.

DEPARTMENT OF LIFESCIENCE (MICROBIOLOGY)
MEWAR UNIVERSITY, GANGRAR (CHITTORGARH)

M.Sc. Microbiology
III Semester
Session 2018-19 onwards

The examination shall consist of four theory papers and two practical

S. No.	Paper Code	CC/DSE/ SEC	Title	Credit
1	M3MB-CT09	CC9	Microbial Physiology and Metabolism	4
2	M3MB-CT10	CC10	Virology	4
3	M3MB-ET01	DSE1	Microbial Genetics	4
		DSE1	Host Parasite Interactions	4
4	M3MB-ET02	DSE2	Microbial Ecology	4
		DSE2	Environmental Microbiology	4
5	M3MB-CP05	CC5-PR	Core Practical-5	4
6	M3MB-EP01	DSE1-PR	DSE Practical-1	4
Total				**24**

Note:

- CC - Core Course
- DSE - Discipline Specific Elective Courses
- PR- Practical
- Students will opt any two Discipline Specific Elective Courses (DSE) out of given options

Paper I: CC9 (M3MB-CT09): MICROBIAL PHYSIOLOGY AND METABOLISM (THEORY)

Unit-I

Chemical composition and structure of bacterial and archaebacterial and cyanobacterial membranes. Lipid bilayer, membrane proteins, Spectrins, Glycophorin, Multipass membrane proteins Bacteriorhodopsin. Membrane Transport : Principles of membrane transport, ion channels and electrical properties of membranes. Uptake of nutrients. Cellular movement; types of locomotion, structures involved in locomotion, structure and arrangement of flagella, Movement in response to external stimuli, mechanism of chemotaxis. Cell signalling, two component system

Unit II

Bacterial nutrition; types and modes of nutrition in bacteria, Nutrient requirements of microbes. Nutritional classification. Bacterial growth; events in cellular growth, growth rate and generation time. Phases of , Growth curve, Growth kinetics, factors effecting growth; temperature, pH, osmotic pressure, salinity, oxygen tension, water, nutrient availability etc. Measurement of growth. Measurement of cell mass and number. Pattern of death. Methods used to study, microbial metabolism – nutrient balance, metabolically blocked microbes; radiolabelled compounds.

Unit III

Autotrophic metabolism: Photoautotrophy; Photosynthetic microorganisms, photosynthetic pigments, and generation of reducing power Absorption spectrum, pigments involved in absorption of light energy, site of absorption in bacteria and cyanobacteria, oxygenic and anoxygenic photosynthesis. Purple sulphur bacteria and the green sulphur bacteria. Chemoautotrophy; sources of energy, Energy yielding processes: oxidation of inorganic compounds. Sulphur bacteria, iron bacteria, nitrifying bacteria, hydrogen bacteria. Photoheterotrophs: purple nonsulphur bacteria.

Unit IV

Heterotrophic metabolism: Metabolism of two carbon compounds: EMP pathway, citric acid cycle, EDP, PPP and other alternate pathways. Fermentation and anaerobic respiration. Anaerobic fermentation – alcoholic fermentation, propionic acid fermentation, formic acid fermentation. Metabolism of one carbon compounds: methylotrophs; Oxidation of methane, methanol, methylamines and carbon assimilation in methylotrophic bacteria and yeasts, Metahnogens: Methanogenesis form H_2,CO_2, CH_3OH, HCOOH, methylamines, energy coupling and biosynthesis in methanogenic bacteria. Significance of methanogenesis, Acetogens: autotrophic pathway of acetate synthesis and CO_2 fixation

Unit- V

Nitrogen fixation by rhizobia; formation and structure of root nodule, Physiology of nitrogen fixation, Importance of leghemoglobin and nitrogenase enzyme. Nitrogen fixing genes. Non leguminous nitrogen fixers, Physiology of hetrocyst and actinorhizal nodules. Factors affecting nitrogen transformation, nitrogen assimilation, incorporation of ammonia into organic compounds

(GOGAT pathway), transporting of fixed nitrogen in symbiotic systems. PGPR. Phosphate solubilizing bacteria, Mechanism of Phosphate solubilisation.

Suggested Readings

1.Ananthanarayan R and Paniker CKJ. (2005). Textbook of Microbiology. 7th edition (edited by Paniker CKJ). University Press Publication.

2. Brooks GF, Carroll KC, Butel JS and Morse SA. (2007). Jawetz, Melnick and Adelberg's Medical Microbiology. 24th edition. McGraw Hill Publication.

3. Goering R, Dockrell H, Zuckerman M and Wakelin D. (2007). Mims' Medical Microbiology. 4th edition. Elsevier. Crofts publication.

4. Willey JM, Sherwood LM, and Woolverton CJ. (2008). Prescott, Harley and Klein's Microbiology. 7th edition. McGraw Hill Higher Education

Paper II: CC10 (M3MB-CT10): VIROLOGY (THEORY)

Unit I

Discovery, origin, nature, physical and chemical properties of viruses. Nomenclature and classification of viruses; LHT system, Baltimore classification, classification schemes of ICTV / ICNV. Ultrasrtructure: Capsid symmetry and types, enveloped and non-enveloped viruses. Viral genomes: Unusual bases (TMV,T4 phage), overlapping genes (X174, Hepatitis B virus), alternate splicing (HIV), terminal redundancy (T4 phage), terminal cohesive ends (lambda phage), partial double stranded genomes (Hepatitis B), long terminal repeats (retrovirus), segmented (Influenza virus), and non-segmented genomes (picornavirus), capping and tailing (TMV) . Satellite viruses. Emerging viruses. Oncogenic viruses: Concepts of oncogenes and proto-oncogenes

Unit II

Bacteriophage; discovery, structure, life cycle, identification, nomenclature. lytic and lysogenic phages: Brief details of M13, Mu, T3, T4, and Lambda, P1 phages. Stages in the Lytic Life Cycle of a typical phage, E. coli PhageT4, E.coli phage lambda. Lysogenic Cycle, Prophage integration and induction. Phage production; burst size. Bacteriophage based vectors for cDNA and genetic libraries. Phage phenotyping.. Properties of a phage infected bacterial culture

Unit III

Viral replication: adsorption, Interaction of viruses with cellular receptors and entry, Concept of early and late proteins, eclipse phase; genome replication, mRNA production, DNA and RNA synthesis, transcription and post transcriptional processing, translation of viral proteins, assembly, maturation and release. Bacterial cell transformation, host cell restriction, transduction.;. One step multiplication curve, Replication strategies of viruses as per Baltimore classification (phi X 174, Retroviridae, Vaccinia, Picorna)

Unit IV

Plant Viruses: Classification and nomenclature. Characteristics of important plant viruses and symptoms, pathogenesis, control of diseases caused by them (TMV, Tomato spotted wilt virus,

Cucumber mosaic virus, Potato virus Y, Cauliflower mosaic virus, Potato virus X, Citrus tristeza virus, Barley yellow dwarf virus), Prevention of crop loss due to virus infection and vector control. NPV and its role in pest management. Animal Viruses: Classification and nomenclature, Characteristics of important animal viruses, and symptoms, pathogenesis, control of diseases caused by them (AIDS, H5N1, SARS, Polio, chickenpox, Smallpox, Herpes, Rabies, influenza, hepatitis). Modes of plant and animal viral transmission: Persistent, non-persistent, vertical and horizontal.

Unit V

Isolation, Purification, Physical and Chemical methods of Assay, Cultivation (embryonated eggs, experimental animals and cell cultures: cell-lines, cell strains and transgenic systems) of plant and animal viruses, Infectivity assay (plaque method, end point method) , Cytopathic effects, Serological methods of viral identification, Genetic analysis of viruses by classical genetic methods. General principles of viral vaccination. Interferons and chemotherapeutic agents and their mode of action. Use of viral vectors in cloning and expression, Gene therapy.

Suggested Reading

1. Medical Virology 10Th Edition by Morag C and Tim bury M C 1994. Churchil Livingstone, London.
2. Introduction to Modern Virology 4th Edition by Dimmock N J, Primrose S. B. 1994. Blackwell Scientific Publications. Oxford.
3. Virology 3 rd Edition by Conrat H.F., Kimball P.C. and Levy J.A. 1994. Prentice Hall, Englewood Cliff, New Jersey. 4. Text Book on Principles of Bacteriology, Virology and Immunology Topley and Wilsons 1995.
5. Molecular Biology, Pathogenesis and Control by S.J. Flint and others. ASM Press, Washington, D.C.
6. Applied Virology. 1984. Edited by Edonard Kurstak. Academic Press Inc.
7. Introduction to Modern Virology by Dimmock.
8. Prion diseases by Gaschup, M.H.
9. Clinical virology Manual by Steven, S., Adinka, R.L., Young, S.A. 10. Principles of Virology. 2000 by Edward Arnold.

M.Sc. Microbiology
SEMESTER-III

Discipline Specific Elective

Paper III: DSE1 (M3MB-ET01): MICROBIAL GENETICS (THEORY)

Unit-I

Prokaryotic Genomes - Structure of the bacterial nucleoid, DNA supercoiling and associated proteins: writhning number, twisting number. Replication and partitioning of the bacterial genome and Genome of Archaea.

Unit-II

Bacterial conjugation: discovery, effective contact and pilli in conjugation, F-factor, the conjugal transfer process; high frequency recombination and Hfr strains, cointegrate formation; the order of chromosome transfer; formation of F prime (F'), Time–of–Entry, Mapping of bacterial genes. Plasmid: F Plasmid , Conjugate plasmid', Non-conjugative plasmid, R plasmid, Col plasmid (copy number and incompatibility) and sex pili. Episomes.: mechanism and significance.Site specific recombination, replicative recombination.

Unit –III

Bacterial Transformation: discovery, mechanism and significance, detection of transformation, development of competence, mechanism of transformation, transfection, Transduction: discovery, mechanism (Generalized and specialized transduction), significance. Sex duction Mutant phenotype. Metagenomics and its applications. Expression of foreign gene in bacteria. Unit-IV Credit hours:10 Conventional, molecular and recent approaches to polyphasic bacterial taxonomy, evolutionary chronometers, rRNA oligonucleotide sequencing, signature sequences, and protein sequences. Microbial genomics: identification of unculturable prokaryotes, safer food production, improved biosensing, genomic islands, pathogenecity islands. Genetically engineered microbes: development , commercial and pratical applicationsconservation.

Unit-IV

Conventional, molecular and recent approaches to polyphasic bacterial taxonomy, evolutionary chronometers, rRNA oligonucleotide sequencing, signature sequences, and protein sequences. Microbial genomics: identification of unculturable prokaryotes, safer food production, improved biosensing, genomic islands, pathogenecity islands. Genetically engineered microbes: development commercial and pratical applications

Unit-V

Gene regulation – Post transcriptional processing of RNAs – methylation, polyadenylation and splicing of mRNA; cutting and modification of tRNA degradation system; CatalyticRNA, Group I and Group II intron splicing; Gene regulation – negative regulation – E. coli lac operon (structural, operator, promoter and repressor genes), Positive regulation – E. coli trp operon; Regulation by

small molecules e.g. ppGpp and cAMP Post-translational processing (removal of fmet from polypeptide; ribosome editing: protein folding); Gene silencing (RNAi):An introduction and its application

Suggested Readings

1. Gardner, E. J,Simmons, M J& D P Snustard ,1991 , Principles of Genetics, 8 edition. John Wiley & Sons.NY.
2. Freifelder .S ,1987 Microbial Genetics, Jones & Bartlett, Boston.
3. Robert H .Tamarin. Principles of Genetics, 5th edition, Cm Brown Publishers.
4. Lewin.B, 1990. Genes, 6 th edition, Oxford University Press.
5. Klug .W.S. & Cummings,MR, 1996, Essentials of Genetics, Mentics Hail. NewJersey.
6. Microbiology – A (Practical) Approach - Bhavesh Patel and Nandini PhanSolutions to Practical
7. Microbiology - Bhavesh Patel and Nandini PhanseExperiments in Biotechnology - Nighojkar and Nighojka

Paper III: DSE1 (M3MB-ET01): HOST-PARASITE INTERACTIONS (THEORY)

Unit I

Microbial parasites: Historical account; Bacteria, Fungi, Viruses, Protozoas, Helminthes and Arthropods, Prions; Host-parasite relationship; Infection-mode of transmission in infection, factors predisposing to microbial pathogenecity, types of infectious diseases

Unit II

Invasion of Microbes: Adsorption to the potential sites, membrane trafficking in eukaryotic cells, routes of invasion and selection of intracellular niche, bacterial manipulation of host cell cytoskeleton, nosocomial infection; Normal microflora of human body; Bacterial toxins and virulence genes; Strategies of host defense.

Unit III

Methods of Disease Diagnosis: Sampling site-normally sterile and with normal microflora; Sample collection-method of collection, transport and processing of samples, interpretation of results; Diagnostic methods- cultured: microscopy, microbial antigen; non-cultured: PCR based microbial typing: Eubacterial identification based on 16s rRNA sequences.

Unit IV

Diagnosis of Infections : Bacteria- Streptococcus, Coliforms, Salmonella, Shigella, Vibrio and Mycobacterium; Fungi-Major fungal diseases, Dermatophytoses, Candidiosis and Aspergillosis DNA and RNA Viruses- POX virus, Rhabdo Virus, Hepatitis Virus and Retro Virus.

UNIT V

Diagnosis of Infections Viruses-AIDS Virus; Protozoan diseases-Amoebiosis, Malaria, Trypnosomiosis, Leishmaniasis; Helminthis diseases- Fasciola hepatica and Ascaris lumbricoides; Filariasis and Schistomiosis.

SUGGESTED READINGS

1. Bailey and Scott Diagnostic Microbiology (2002). Betty A. Forbes, Daniel F. Sahm, Alice S. Weissefeld, Ernest A Trevino. Published by C.V. Mosby
2. Medical Microbiology (1997). Edited by Greenwood. D, Slack. R and Peutherer. J, ELST Publishers.
3. Fundamental of Molecular Diagnostics (2007). David E. Bruns, Edward R. Ashwood, Carl A. Burtis. Sauders group.
4. Henry.S. Clinical Diagnosis and Management by Laboratory Methods (2007). Mepherson. Molecular Diagnostics for the Clinical Laboratorian 2nd ed. (2006). W.B.Coleman. Humana Press

Paper IV: DSE2 (M3MB-ET02): MICROBIAL ECOLOGY (THEORY)

Unit – I

Soil microbiology: Soil as a habitat for organisms and their reactions, soil texture and properties, distribution of microorganisms in soil and its significance, microbial density in soil- zymogenous and autochthonous flora in Soil. Interaction between microbes and plants: rhizosphere and zhizoplane microbes, R:S ratio, spermosphere, phyllosphere microorganisms, their importance in plant growth. Interaction among microorganisms: mutualisms, commensalism, competition, amensalism, parasitism and predation.

Unit - II

Air microbiology: microbial population and its significance. Aerosol, droplet nuclei, air pollution-sources (Microbiological) – air quality analysis- air sampling devices. Isolation, enumeration and methods of studying. Water microbiology: microbial population and its significance, Isolation and enumeration. Methods of studying water microbiology. Eutrophication, algal blooms and red tides. Definition, causes, effects. Water treatment Primary, secondary and tertiary. Drinking water-Potability- MPN technique. Marine Microbiology: biodiversity resources, Microbial corrosion, Deep sea microbiology and Geothermal Events.

Unit – III

Microbes in extreme environments: Habitat, biodiversity, metabolic characteristics, physiological adaptations, evolutionary, ecological, commercial and biotechnological significance. Thermophiles; Classification and properties,. Hyperthermophiles and extreme thermophilic habitats. Alkaline environment and Alkalophiles: Classification and properties, Soda lakes and deserts , calcium alkalophily,. Acidophiles: Classification, life at low pH, acidotolerence, applications.

Unit – IV

Halophiles: Classification and properties, Evolutionary, ecological and commercial significance, Dead Sea, discovery basin, cell walls and membranes – Purple membrane, compatible solutes. Osmoadaptation / halotolerence. Applications of halophiles and their extremozymes. Barophiles: Classification and properties, Evolutionary, ecological and commercial significance, high-pressure habitats, life under pressure, death under pressure.

Unit V

Psycrophiles and psychrotrophs: Classification and properties, Evolutionary, ecological and commercial significance, Role of microorganisms in the biogeochemical cycling of carbon, nitrogen, phosphorus, sulphur, iron, manganese, silicon etc.). nitrogen fixing microorganisms root nodule bacteria – non symbiotic Nitrogen fixers- Rhizobium and phosphate solubilisers. Methanogens, Methylotrophs. Microbial Biofilms: Nature, properties and significance, Mechanism of microbial adherence.

Suggested Readings

1. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA.
2. Atlas RM. (1989). Microbiology: Fundamentals and Applications. 2nd Edition, MacMillan Publishing Company, New York.
3. Madigan MT, Martinko JM and Parker J. (2009). Brock Biology of Microorganisms. 12th edition Pearson/ Benjamin Cummings.
4. Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
5. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
6. Lynch JM & Hobbie JE. (1988). Microorganisms in Action: Concepts & Application in Microbial Ecology. Blackwell Scientific Publication, U.K.
7. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press.

Paper IV: DSE2 (M3MB-ET02): ENVIRONMENTAL MICROBIOLOGY (THEORY)

Unit I

Applications of microbes in biodegradation and bioremediation: Microbial degradation of cellulose, lignin, pesticides, xenobiotics and other recalcitrant chemicals, petroleum and hydrocarbons and its ecological significance. Bioprospecting and bioleaching, Bioaccumulation of heavy metals ions from industrial effluents.

Unit II

Biomagnification and degradative plasmids, biotransformation. Biodeterioration and its control. Biological control and biopesticides. definition, significance, types , sources, manufacture, use and mode of action. Entemopathogenic fungi, viral insecticides. significance of Bacillus thuringiensis in biocontrol.

Unit III

Microbes and pollution :waste water; Types, Sources, Microbiology. Methods of waste water treatment. Eutrophication: Definition, causes and effects. Algal blooms, Red tides. Solid waste: Source, types and characterization. Methods of treatment: Physical, chemical, biological, aerobic, anaerobic, primary, secondary and tertiary treatments. Use of genetically engineered organisms for control of pollution.

Unit IV

Bioconversion of Solid Waste: Composting, vermi composting and vermi culture. Microbial biofertilizers: types, sources, manufacture and significance. Green manuring, Mycorrhizae as fertilizers: Rhizhobia and other symbiotic and non symbiotic nitrogen fixing microbes as biofertilizer. Application of microbes as biofertilizers. Significance and application of PSB (Phosphate Solubilizing Bacteria) and PGPR (Plant Growth Promoting Rhizobacteria).

Unit V

Microbes as biological weapons, Role of microbes in production of Biofuels. Biogas production and factors affecting methane formation. Biosensors: Principle, working, Types of biosensors Applications of biosensors in environmental monitoring. Application of microbes as biosensors.

Suggested Readings

1. Mooray Moo-Young. (Eds). Comprehensive Biotechnology (Vol. I, II, III) Pergamon Press, England.
2. Metcalf and Eddy. Waste water engineering treatment and uses. McGraw Hill.
3. Jogdand, S.N. Environmental Biotechnology. Himalaya Publication House.
4. De, A.K. Environmental Chemistry. Wiley Eastern Ltd.
5. Abbasi and Abbasi. Renewable Energy Sources and their environmental impact. Prentice Hall of India, Pvt. Ltd.
6. Chatterji, A.K. Introduction to Environmental Biotechnology. Prentice Hall of India.
7. Thakur, I. S. Text Book of Environmental Biotechnology. I. K. International Publisher, New Delhi.
8. Mohapatra, P. K. Text Book of Environmental Biotechnology. I. K. International Publisher, New Delhi.

DEPARTMENT OF LIFESCIENCE (BIOTECHNOLOGY)
MEWAR UNIVERSITY, GANGRAR (CHITTORGARH)

M.Sc. Microbiology
IV Semester
Session 2018-19 onwards

Choice of A or B				
A.				
S. No.	**Paper Code**	**CC/DSE/ SEC**	**Title**	**Credit**
1	M4MB-PJ01	Training	Major Research Project (Research Work/Training)	**26**
B.				
1	M4MB-PJ02	Minor Project	Minor Research Project	14
2	M4MB-ET03	DSE3	Research Methodology	4
			Food and Dairy Microbiology	4
3	M4MB-ET04	DSE4	Advances in Microbiology	4
			Medical Microbiology	4
4	M3MB-EP02	DSE2 PR	DSE Practical-2	4
	Total			**26**

Note:

- CC - Core Course
- DSE - Discipline Specific Elective Courses
- PR- Practical
- Students will opt any two Discipline Specific Elective Courses (DSE) out of given options.
- In 4th semester the students have an option of either doing Major research project (MRP) or he/she can do Minor Research Project along with take any two DSE electives.

CHOICE A. Major Research Projects (M4MB-PJ0)

CHOICE B. 2 Minor Research Projects + 2 DSE

Paper I: Minor Project (M4MB-PJ02)

Discipline Specific Elective

PAPER II: DSE3 (M4MB-ET03): RESEARCH METHODOLOGY (THEORY)

Unit I:

Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process, Problem Identification & Formulation – Research Question, Investigation Question, Measurement Issues, Hypothesis– Qualities of a good Hypothesis, Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance

Unit II:

Research Design: Concept and Importance in Research, Features of a good research design, Exploratory Research Design– concept, types and uses, Descriptive Research Designs– concept, types and uses. Experimental Design: Concept of Independent & Dependent variables.

Unit III:

Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample size

Unit IV:

Data Analysis: Data Preparation– Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association. Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Science, Impact factor of Journals, When and where to publish? Ethical issues related to publishing, Plagiarism and Self-Plagiarism

Unit V:

Use of Encyclopedias, Research Guides, Handbook etc., Use of tools / techniques for Research: methods to search required information effectively, Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism

Suggested Readings

1. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition
2. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.

3. Research Methodology – C.R.Kothari

PAPER II: DSE3 (M4MB-ET03): FOOD AND DAIRY MICROBIOLOGY (THEORY)

Unit I

Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general. Microbial spoilage of various foods Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods

Unit II

Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, high voltage pulse, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, SO2, nitrite and nitrates, ethylene oxide, antibiotics and bacteriocins

Unit III

Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tampeh, Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market.

Unit IV

Food intoxications: Staphylococcus aureus, Clostridium botulinum and mycotoxins; Food infections: Bacillus cereus, Vibrio parahaemolyticus, Escherichia coli, Salmonellosis, Shigellosis, Yersinia enterocolitica, Listeria monocytogenes and Campylobacter jejuni

Unit V

HACCP, Indices of food sanitary quality and sanitizers Cultural and rapid detection methods of food borne pathogens in foods and introduction to predictive microbiology.

SUGGESTED READINGS

1. Adams MR and Moss MO. (1995). Food Microbiology. 4th edition, New Age International (P) Limited Publishers, New Delhi, India.
2. Banwart JM. (1987). Basic Food Microbiology. 1st edition. CBS Publishers and Distributors, Delhi, India.
3. Davidson PM and Brannen AL. (1993). Antimicrobials in Foods. Marcel Dekker, New York.
4. Dillion VM and Board RG. (1996). Natural Antimicrobial Systems and Food Preservation. CAB International, Wallingford, Oxon.

PAPER III: DSE4 (M4MB-ET04): ADVANCES IN MICROBIOLOGY (THEORY)

Unit I

Evolution of Microbial Genomes

Salient features of sequenced microbial genomes, core genome pool, flexible genome pool and concept of pangenome, Horizontal gene transfer (HGT), Evolution of bacterial virulence Genomic islands, Pathogenicity islands (PAI) and their characteristics

Unit II

Metagenomics

Brief history and development of metagenomics, Understanding bacterial diversity using metagenomics approach, Prospecting genes of biotechnological importance using metagenomics Basic knowledge of viral metagenome, metatranscriptomics, metaproteomics and metabolomics.

Unit III

Molecular Basis of Host-Microbe Interactions

Epiphytic fitness and its mechanism in plant pathogens, Hypersensitive response (HR) to plant pathogens and its mechanism, Type three secretion systems (TTSS) of plant and animal pathogens.

Unit IV

Biofilms

Biofilms: types of microorganisms, molecular aspects and significance in environment, health care, virulence and antimicrobial resistance

Unit V

Systems and Synthetic Biology

Networking in biological systems, Quorum sensing in bacteria, Co-ordinated regulation of bacterial virulence factors, Basics of synthesis of poliovirus in laboratory, Future implications of synthetic biology with respect to bacteria and viruses

SUGGESTED READING

1. Fraser CM, Read TD and Nelson KE. Microbial Genomes, 2004, Humana Press
2. Miller RV and Day MJ. Microbial Evolution- Gene establishment, survival and exchange, 2004, ASM Press
3. Bull AT. Microbial Diversity and Bioprospecting, 2004, ASM Press
4. Sangdun C. Introduction to Systems Biology, 2007, Humana Press
5. Klipp E, Liebermeister W. Systems Biology – A Textbook, 2009, Wiley –VCH Verlag
6. Caetano-Anolles G. Evolutionary Genomics and Systems Biology, 2010, John Wiley and Sons
7. Madigan MT, Martink JM, Dunlap PV and Clark DP (2014) Brook's Biology of Microorganisms, 14th edition, Pearson-Bejamin Cummings

8. Wilson BA, Salyers AA Whitt DD and Winkler ME (2011)Bacterial Pathogenesis- A molecular Approach, 3rd edition, ASM Press,
9. Bouarab K, Brisson and Daayf F (2009) Molecular Plant-Microbe interaction CAB International
10. Voit EO (2012) A First Course in Systems Biology, Ist edition,Garland Sci

PAPER III: DSE4 (M4MB-ET04): MEDICAL MICROBIOLOGY (THEORY)

Unit I

Brief idea of virulence of microorganism, invasiveness, bacterial enzymes as invasive factors, immune reactions, toxins (bacterial, fungal, algal), Epidemiology- definition, diseases out break, sources, reservoirs of pathogens, epidemics. Disease transmission- portals of entry, air borne transmission, food and water borne transmission, blood borne infections, post surgical infections. Normal microflora of human body.

Unit II

Nosocomial infections, Diagnosis of infectious disease- blood count, hypersensitivity reactions, isolation and identification of pathogens by culture methods (Respiratory tract, CSF, urine, blood, vaginal smear and skin lesion culture). Disease prevention: prevention procedures, removal from food , water and soil. Vector control,quarantine etc. Immunization, Antibiotic susceptibility testing.

Unit-III

Epidemiology, causal organism, life cycle, mode of action ,transmission, detection, control, therapeutic measures of following fungal diseases: Mycoses, Mycotoxicoses, Epidemiology, Phycomycosis, Candidiasis, Actinomycosis, Dermatophytosis, Aspergillosis, Otomycosis and Pencillinosis. zoonosis and vector transmission of human diseases: Rocky mountain spotted fever, typhus fever, Lyme disease.

Unit-IV

Pathogenic viruses, Classification, Epidemiology, causal organism, life cycle, mode of action ,transmission, detection, control, therapeutic measures of following viral diseases: Influenza, Measles, Mumps, Rubella and Small pox, Yellow fever, Dengue, Polio, Viral hepatitis, Rabies, Cold sores, AIDS, genital herpes, warts.

Unit-V

Epidemiology, causal organism, life cycle, mode of action ,transmission, detection, control, therapeutic measures of following bacterial and protozoan diseases: Tuberculosis, Diptheria, Meningitis, Pertussis, Streptococcal Pneumonia, Cholera, Botulism, Typhoid, Tetanus, Gonorrhoea, Syphilis, Leprosy, Malaria, Leishmaniasis, Toxoplasmosis, Meningitis, Balantidiosis, Vaginitis, Giardiasis, Trypanosomiasis, Amoebiasis.

SUGGESTED READINGS

1. Devlin RM. (1975). Plant Physiology. 3rd edition, Willard Grant Press.
2. Gottschalk G. (1986). Bacterial Metabolism. 2nd edition. Springer Verlag

3. Madigan MT, Martinko JM and Parker J. (2003). Brock Biology of Microorganisms. 10th edition. Pearson/ Benjamin Cummings.
4. Moat AG and Foster JW. (2002). Microbial Physiology. 4th edition. John Wiley & Sons.
5. Reddy SR and Reddy SM. (2005). Microbial Physiology. Scientific Publishers India.
6. Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. (1987). General Microbiology. 5th edition, McMillan Press.
7. Willey JM, Sherwood LM, and Woolverton CJ. (2008). Prescott, Harley and Klein's Microbiology. 7th edition. McGraw Hill Higher Education.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

Animal Genetics

UNIT I

History of Genetics in brief. Chromosome number and morphology in different species of livestock and poultry. Mitosis, Meiosis, gameto-genesis, Law of segregation and intra-allelic modification, Law of independent assortment and intra-allelic modification,

UNIT II

Gene interaction and inter-allelic modification, Epistasis, Multiple alleles, Lethal and sub-lethal characters, Sex linked traits, Sex limited and sex influenced traits, Linkage and crossing over, Mutation, Cytogenetics – Introduction and applications in animal breeding, Cytogenetics

UNIT III

Lymphocyte culture technique, Chromosomal Aberrations, Extra chromosomal inheritance, Gene concept – classical and molecular, Genetic structure of population, Gene and genotypic frequency, Hardy – Weinberg Law, Applications of Hardy – Weinberg Law, Forces changing Gene and genotypic frequency. (mutation and migration), Forces changing Gene and genotypic frequency.

UNIT IV

(selection and drift), Nature and properties, Population Mean, Average effect & breeding Value, Concept of G x E interaction, Components of Variance – Genetic and Environment, Resemblance between relatives,

UNIT V

Heritability: It's concepts, methods of estimation & it's uses, Repeatability: It's concepts, methods of estimation & it's uses, Genetic and phenotypic Correlations among economic traits.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

Animal Evolutionary Biology

UNIT I

Introduction to Evolutionary Biology: Principles of evolution, Natural selection and adaptation

Speciation and species concepts

UNIT II

Principles of Evolutionary Genetics: Genetic variation and its sources, Genetic drift and gene flow

Molecular evolution and phylogenetics

UNIT III

Paleontology and Fossil Record: Fossilization processes and animal fossils, Evolutionary trends in animal evolution, Study of ancient animal lineages

UNIT IV

Molecular Phylogenetics and Evolutionary Genomics: Molecular markers and phylogenetic reconstruction, Comparative genomics in animal evolution, Evolutionary processes and molecular adaptation

UNIT V

Evolution of Behavior: Evolutionary principles in animal behavior, Social behavior and group dynamics, Communication and mating systems

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

Biophysics

UNIT I

Introduction to Biophysics, Definition and scope of biophysics, Historical developments and key milestones, Interdisciplinary nature of biophysics

UNIT II

Biomolecular Structure and Dynamics, Protein structure and folding, Nucleic acid structure and dynamics, Molecular interactions and non-covalent forces

UNIT III

Membrane Biophysics, Lipid bilayers and membrane properties, Membrane proteins and ion channels, Membrane transport and membrane potential

UNIT IV

Transport Processes in Biological Systems, Diffusion and osmosis, Active transport and ion pumps

Transport across cell membranes

UNIT V

Energy Conversion in Biological Systems, Photosynthesis and light energy conversion, ATP synthesis and energy metabolism, Molecular motors and muscle contraction

Recommended Textbooks:

- "Biophysics: An Introduction" by Rodney Cotterill
- "Physical Biology of the Cell" by Rob Phillips, Jane Kondev, Julie Theriot, Hernan Garcia
- "Principles of Biophysics" by Neil A. Forbes
- "Biophysics: Searching for Principles" by William Bialek

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

URBAN ECOSYSTEMS

Introduction: The paper is designed to enable the students to examine the existing environmental issues, conflicts and their potential role in urban development. It beholds importance as interaction between urban society and its environment transpires in governance and policy decisions. It also aims to address key challenges posed by increasing development to far-reaching goal of sustainability in urban areas.

UNIT 1: Environment in an urban setting

Introduction to urbanization; urban sprawl and associated environmental issues. Man as the driver of urban ecosystem; commoditization of nature; metros, cities and towns as sources and sinks of resources; resource consumption and its social, cultural, economic and ecological perspectives; urban transformation; increasing challenges posed by modernity for the environment; urban pollution (air, water, soil).

UNIT 2: Urban dwelling

Housing scenario across a range of large-medium-small cities; poverty and slums in an urban context; Town planning Acts and their environmental aspects; energy consumption and waste disposal as well as accumulation; environmental costs of urban infrastructure, urban settings as loci of sustainability; challenges associated with sustainability and urban future.

UNIT 3: Natural spaces in a city

Concept of 'controlled nature'; scope, importance and threats to nature in the city; organization and planning of green spaces such as parks, gardens and public spaces; concept of green belts; urban natural forest ecosystem as green lungs.

UNIT 4: Planning and environmental management

Urban planning and its environmental aspects from historical and contemporary perspectives; benefits of environmental management; introduction to green buildings; urban governance; political complexity of applying ecological science to urban policy and planning, smart cities, management of urban environment; alternative resources; policy and management decisions.

Practicals: Based on the theory.

Text Books:

- Gaston, K.J. 2010. *Urban Ecology*. Cambridge University Press, New York.
- Richter, M. & Weiland, U. (ed.). 2012. *Applied Urban Ecology*. Wiley-Blackwell, UK.

Reference Books:

- D'Monte, Darryl. 1985. *Industry versus Environment Temples or Tombs*. Three Controversies, Delhi, CSE.

- Ernstson, H. 2011. *Re-translating nature in post-apartheid Cape Town: The material semiotics of people and plants at Bottom Road.* In: Heeks, R., (Ed.) Conference on "Understanding Development through Actor-Network Theory", London School of Economics, 30 June, London.
- Grimm, N. B., Faeth, S. H., et al. 2008. Global Change and the Ecology of Cities. *Science* **319**: 756-760.
- Hinchliffe, S. & Whatmore, S. 2006. Living cities: Towards a politics of conviviality. *Science as Culture* **15**: 123–138.
- McIntyre, N.E. 2000. Urban ecology as an interdisciplinary field: differences in the useof 'urban' between the social and natural sciences. *Urban Ecosystems* **4**: 5-24.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

ENVIRONMENTAL POLLUTION AND HUMAN HEALTH

Introduction: This paper deals with different aspects of environmental contamination, which have adverse effects on human health. It will lay emphasis on understanding mechanisms of pollutants impacting human health by developing an understanding of different types of pollutants, their sources and mitigation measures. The students will also be introduced to the concept of permissible limits.

UNIT 1: Chemistry of environmental pollutants

Definition of pollution; pollutants; classification of pollutants; solubility of pollutants (hydrophilic and lipophilic pollutants), transfer of pollutants within different mediums, role of chelating agents in transferring pollutants, concept of biotransformation and bioaccumulation, concept of radioactivity, radioactive decay and half-life of pollutants, organometallic compounds, acid mine drainage, causes of soil pollution and degradation; effect of soil pollution on environment, control strategies.

UNIT 2: Air pollution

Ambient air quality: monitoring and standards (National Ambient Air Quality Standards of India); air quality index; sources and types of pollutants (primary and secondary); smog (case study); effects of different pollutants on human health (NOx, SOx, PM, CO, CO_2, hydrocarbons and VOCs) and control measures; indoor air pollution: sources and effects on human health. Noise pollution: sources and permissible ambient noise levels; effect on communication, impacts on life forms and humans, control measures, Radioactive material and sources of radioactive pollution.

UNIT 3: Freshwater and marine pollution

Sources of surface and ground water pollution; water quality parameters and standards; organic waste and water pollution; eutrophication; COD, BOD, DO; effect of water contaminants on human health (nitrate, fluoride, arsenic, chlorine, cadmium, mercury, pesticides); water borne diseases; concept and working of effluent treatment plants (ETPs).
Marine resources and their importance; sources of marine pollution; oil spill and its effects; coral reefs and their demise; coastal area management; existing challenges and management techniques (planning, construction, environmental monitoring of coastal zones), thermal pollution and its effects.

UNIT 4: Pollution control

Activated Sludge Process (ASP) – Trickling Filters – oxidation ponds, fluidized bed reactors, membrane bioreactor neutralization, ETP sludge management; digesters, up flow anaerobic sludge blanket reactor, fixed film reactors, sequencing batch reactors, hybrid reactors, bioscrubbers, biotrickling filters; regulatory framework for pollution monitoring and control; case study: Ganga Action Plan; Yamuna Action Plan; implementation of CNG in NCT of Delhi.

Practicals: Based on the theory.

Text Books:

- Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2006. *Environmental and Pollution Science*. Elsevier Academic Press.
- Purohit, S.S. & Ranjan, R. 2007. *Ecology, Environment & Pollution*. Agrobios Publications.

Reference Books:

- Gurjar, B.R., Molina, L.T. & Ojha C.S.P. 2010. *Air Pollution: Health and Environmental Impacts*. CRC Press, Taylor & Francis.
- Hester, R.E. & Harrison, R.M. 1998. *Air Pollution and Health*. The Royal Society of Chemistry, UK.
- Park, K. 2015. *Park's Textbook of Preventive and Social Medicine* (23rd edition). Banarsidas Bhanot Publishers.
- Vesilind, P.J., Peirce, J.J., & Weiner R.F. 1990. *Environmental Pollution and Control*.Butterworth-Heinemann, USA.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

LAND AND SOIL CONSERVATION AND MANAGEMENT

Introduction: This paper introduces students to the fundamentals of land and soil degradation. Each unit covers a range of topics, which will help students develop basic understanding of properties of soil and how the quality of land and soil degrades due to anthropogenic activities.

UNIT 1: Fundamentals of soil science

Land as a resource, ecological and economic importance of soil; Soil formation; classification of soil; soil architecture; physical properties of soil; soil texture; soil water holding capacity; soil temperature; soil colloids; soil acidity and alkalinity; soil salinity and sodicity; soil organic matter; micronutrients of soil; nitrogen, sulphur, potassium and phosphorus economy of soil; soil biodiversity; soil taxonomy maps.

UNIT 2: Soil degradation - causes

Types and causes of soil degradation; Soil resistance and resilience; nature and types of soil erosion; non-erosive and erosive soil degradation; losses of soil moisture and its regulation; nutrient depletion; soil pollution due to mining and mineral extraction, impact soil degradation on agriculture and food security; industrial and urban development, toxic organic chemicals, and organic contaminants in soils; fertilizers and fertilizer management; recycling of soil nutrients.

UNIT 3: Land use changes and land degradation

Land resources: types and evaluation; biological and physical phenomena in land degradation; visual indicators of land degradation; drivers of land degradation deforestation, desertification; habitat loss, loss of biodiversity; range land degradation; land salinization; human population pressure, poverty, socio-economic and institutional factors; drivers of land use and land cover change in major geographic zones and biodiverse regions with particular reference to the Himalaya and the Western Ghats.

UNIT 4: Land degradation and its control

Economic valuation of land degradation; onsite and offsite costs of land degradation; loss of ecosystem services; effects on nutrient cycles; future effects of soil degradation; emerging threats of land degradation to developing countries Sustainable land use planning; role of databases and data analysis in land use planning control and management; land tenure and land policy; legal, institutional and sociological factors; integrating land degradation assessment into conservation.

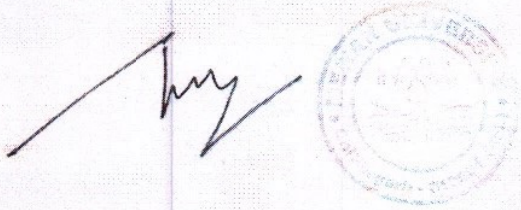
Practicals: Based on the theory/fieldwork.

Text Books:

- Brady, N.C. & Well, R.R. 2007.*The Nature and Properties of Soils* (13th edition), Pearson Education Inc.

Reference Books:

- Gadgil, M. 1993. Biodiversity and India's degraded lands. *Ambio* **22:** 167-172.
- Johnson; D.L. 2006. *Land Degradation* (2nd edition). Rowman & Littlefield Publishers.
- Marsh, W. M. & Dozier,J. 1983. *Landscape Planning: Environmental Applications*. John Wiley and Sons.
- Oldeman, L. R. 1994. The global extent of soil degradation. *Soil resilience and sustainable land use*, *9*. (http://library.wur.nl/isric/fulltext/isricu_i26803_001.pdf).
- Pandit, M.K. et. al. 2007. Unreported yet massive deforestation driving loss of endemic biodiversity in Indian Himalaya. *Biodiversity Conservation* **16**: 153-163.
- Pandit, M.K. &Kumar, V. 2013. Land use and conservation challenges in Himalaya: Past, present and future. In: Sodhi, N.S., Gibson, L. & Raven, P.H. *Conservation Biology:*
  Voices from the Tropics. pp. 123-133. Wiley-Blackwell, Oxford, UK (file:///Users/mkpandit/Downloads/Raven%20et%20al.%202013.%20CB%20Voices%20from %20Tropics%20(2).pdf) .
- Peterson, G. D., Cumming, G. S. & Carpenter, S. R. 2003. Scenario planning: a tool for conservation in an uncertain world. *Conservation Biology* 17: 358-366.
- Scherr, S. J. 1999. *Soil degradation: A threat to developing-country food security by 2020?* (Vol. 27). International Food Policy Research Institute.



MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

EVOLUTIONARY BIOLOGY

UNIT I

Introduction: Evolutionary Biology before Darwin, Darwin, after Darwin. Evolutionary synthesis. Fact and theory.

UNIT II

Biological diversity: Species and classification. Phylogenetic trees, reading and using trees. Tree of Life. The fossil record. Geological fundamentals. Phylogeny and the fossil record. Evolutionary trends. Rates of evolution. The geography of life. Major patterns of distribution. Historical biogeography, phylogeography. Genetic diversity: Genes, genomes, mutations, karyotypes. Sources of phenotypic variation. Genetic variation in populations. Variation among populations.

UNIT III

Microevolution: Genetic drift, sampling, coalescence. Founder effects. Neutral theory of molecular evolution. Natural selection. Adaptation in action. Experimental studies. Levels of selection. Genetical theory of natural selection. Fitness, modes and models of selection. Evolution of phenotypic traits, Conflict and co-operation. Species and speciation. Reproductive success. Co-evolution.

UNIT IV

Macroevolution: Inferring phylogenies. Gene trees, species trees. Patterns of evolutionary change. Adaptive radiation. Evolution and development.

UNIT V

Biodiversity: Estimating changes in biodiversity. Taxonomic diversity through the Phanerozoic. The future of biodiversity.

SUGGESTED READINGS:

1. David Briggs, Stuart Max Walters (1997). Plant Variation and Evolution, Cambridge University Press.
2. Douglas J. Futuyma (1998). Evolutionary Biology (3rd Edition), Sinauer Associates.
3. Mark Ridley (2003) Evolution (3rd edition), Blackwell.
4. Roderic D. M. Page, Edward C. Holmes (1998). Molecular Evolution: A Phylogenetic Approach, Blackwell.
5. Scott R, Freeman and Jon C. Herron (2003). Evolutionary Analysis, Prentice Hall.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH
DEPARTMENT OF LIFE SCIENCE

.GENETICS AND CYTOGENETICS

UNIT I

Microbial Genetics: Viral and bacterial genomes and derived vectors; Recombination in viruses and bacteria (transformation, conjugation and transduction); Fine structure of gene; Prokaryotic gene regulation; Fungal genetics – mating types and genetic exchange, heterokaryosis, parasexual cycle.

UNIT II

Mendelian and Non-Mendelian Inheritance: Meiosis; Chromosome theory of inheritance; Mendelian laws; Gene interactions; Organelle inheritance.
Eukaryotic Genome: Evolution, structure and organization; Gene regulation.

UNIT III

Recombination in Eukaryotes: Linkage and crossing over: basic concepts, linkage maps, correlation of genetic and physical maps, molecular markers and construction of linkage maps; Molecular mechanism of recombination; QTL mapping.

UNIT IV

Mutation: Basic concept, spontaneous and induced mutations, allele theory, physical and chemical mutagens; Molecular basis of mutations; Transposons and their use in mutagenesis and gene tagging in plant systems; Oncogenes and cancer.
Concepts in: Developmental genetics; Behavioral genetics; Population genetics and Quantitative genetics.

UNIT V

Cytogenetics: Chromosome: Structure and nomenclature, centromere and telomere; Sex determination: mechanisms, sex chromosomes; Chromosomal aberrations: Duplications, deficiencies/deletions, inversions, interchanges/translocations; Role of chromosomal aberrations in crop evolution; Ploidy changes: Haploids, polyploids and aneuploids; Genome analysis in crop plants; Molecular Cytogenetics: FISH, GISH, FIBER-FISH, Flow Cytogenetics, Flow karyotyping, Applications of molecular cytogenetics

SUGGESTED READINGS:

1. Acquaah G (2007). Principles of Plant Genetics and Breeding, Blackwell Publishing Ltd.

   USA.
2. Allard RW (1999). Principles of Plant Breeding (2nd Edition), John Wiley and Sons.

3. Hartl DL and Jones EW (2007). Genetics – Analysis of Genes and Genomes, 7th edition, Jones and Barlett publishers.
4. Hartwell LH, Hood L, Goldberg ML, Reynolds AE, Silver LM, Veres RC (2006). Genetics – From Genes to Genomes, 3rd edition, McGraw Hill.
5. Lewin B (2008). Genes IX, Jones and Barlett Publishers.
6. Singh RJ (2002). Plant Cytogenetics, 2nd edition, CRC Press.
7. Smartt J and Simmonds NW (1995). Evolution of Crop Plants (2nd Edition) Longman.
8. Strickberger MW (2008). Genetics, 3rd Edition, Pearson (Prentice Hall).
9. Weising K, Nybom H, Wolff K and Kahl G (2005) DNA Fingerprinting in Plants: Principles, Methods and Applications, 2nd ed. Taylor and Francis Group, Boca Raton, FL.