DELHI TECHNOLOGICAL UNIVERSITY

MINUTES

of

27th Meeting

ACADEMIC COUNCIL

Date   : **19.02.2021**

Time   : **11:00 a.m.**

Venue : **Video Conferencing (Online)**

DTU Campus, Shahbad Daulatpur, Bawana Road, Delhi-110042

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DELHI TECHNOLOGICAL UNIVERSITY

Established under Govt. of Delhi Act 6 of 2009
(Formerly Delhi College of Engineering)
BAWANA ROAD, SHAHBAD DAULATPUR, DELHI-110042

No. F.DTU/Org/AC/Meeting/01(1)/10/Vol-XII   **Dated :**

Minutes of the 27th meeting of the Academic Council held online on 19.02.2021 at 11:00 a.m.

The following members were present:

1. Prof. Yogesh Singh, Vice Chancellor, Delhi Technological University and Chairperson, Academic Council.
2. Prof. J.P. Saini, Vice Chancellor, Netaji Subhash University of Technology, Delhi (nominee of University Grants Commission)
3. Prof. Neharika Vohra, Vice Chancellor, Delhi Skill & Entrepreneurship University, Dwarka, Delhi.
4. Prof. D.P. Goyal, Director, Indian Institute of Management, Shilong.
5. Prof. B.R. Chahar, Professor, Civil Engineering, Indian Institute of Technology, Delhi (nominee of All India Council for Technical Education)
6. Prof. R.S. Mishra, Dean (Outreach & Extension Activities)
7. Prof. Ashutosh Trivedi, Dean (Industrial Research Development)
8. Prof. Vishal Verma, Dean (International Affairs)
9. Prof. S.C. Sharma, Dean Academic (PG)
10. Prof. Madhusudan Singh, Dean Academic (UG)
11. Prof. S. Indu, Dean (Student Welfare)
12. Prof. Narendra Kumar (II), Dean (Student Discipline) & Chief Warden
13. Prof. Rajesh Rohilla, Dean (Alumni Affairs)
14. Prof. Samsher, Dean (Continuing Education), Registrar and Member Secretary, Academic Council, DTU
15. Prof. V.K. Minocha, Head, Civil Engineering Department
16. Prof. Rinku Sharma, Head, Applied Physics Department
17. Prof. S. Sivaprasad Kumar, Head, Applied Mathematics Department
18. Prof. Kapil Sharma, Head, Department of Information Technology
19. Prof. Rajni Jindal, Head, Computer Science &Engineering Department
20. Prof. S.G. Warkar, Head, Applied Chemistry Department
21. Prof. N. S. Raghava, Head, Electronics & Communication Department
22. Dr. Nand Kumar, Head, Department of Humanities
23. Prof. Pravir Kumar, Head, Department of Bio-Technology
24. Prof. Ranganath M. S., Head, Department of Design
25. Dr. Archna Singh, Head, Delhi School of Management
26. Sh. Kamal Pathak, Controller of Examinations
27. Prof. Pragati Kumar, Professor, Electrical Engineering Department
28. Prof. Reeta Wattal, Professor, Mechanical Engineering Department
29. Sh. Rajesh Birok., Associate Professor, Electronics and Communication
30. Dr. M. Jayasimhadri, Assistant Professor, Applied Physics Department

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Following persons have also been invited to attend the meeting as special invitee:

1. Dr. Girish Kumar, Chief Executive Officer, DTU-Innovation and Incubation Foundation
2. Dr. Rama Kant Shukla, Librarian
3. Sh. D.P. Dwivedi, Consultant, Finance & Planning
4. Prof. Rajeshwari Pandey, Associate Dean Academic (UG)
5. Dr. Ruchika Malhotra, Associate Dean, Industrial Research Development
6. Dr. Rishu Chaujar, Associate Dean, Academic (PG)

Prof. Bhim Singh, Electrical Engineering Department, Indian Institute of Technology, Delhi; Prof. R.C. Sharma, Director, University School of Management and Entrepreneurship; Prof. S.K. Singh, Head, Environmental Engineering Department; Prof. Uma Nangia, Head, Electrical Engineering Department; Prof. Naokant Deo, In-charge, B.Tech (Evening) Department could not attend the meeting due to their pre-occupations.

Agenda 27.1 : Opening Remarks by the Chairperson.

Hon'ble Vice Chancellor welcomed all the members of Academic Council in its 27th meeting held online on 19.02.2021. He informed the members that the University is going to start practical classes from 22nd Feb,2021 following the GNCTD/ MHA guidelines. However, the theory classes will continue to be engaged online. Regarding hostel accommodation, the students of other States will only be given the hostel accommodation with single occupancy to ensure safety of the student.

He further informed that new Academic Block and Hostel Buildings costing about 292 crores is partially ready and Department of Computer Science & Engineering (CSE), Information Technology (I.T.), Software Engineering (SE) and Mathematics & Computing (MC) will be shortly shifting into new building.

Recently, we have celebrated 4th Research Excellency Award Ceremony on 15.02.2021 and this time 191 award has been given to the faculty & staff. An amount of 76.7 lacs have been awarded to different faculty this year. Vice Chancellor further congratulates to Academic Council for framing such a wonderful policy for boosting the research in DTU.

He further informed that DTU have been awarded 53.7 marks in Citation category by Times Higher Education Ranking System which is better than many good institutions of India.

Regarding initiative of Outreach & Extension Division, he informed that first computer laboratory on wheels will be ready by March,2021. This will enhance the reach of DTU in the remote areas of Delhi & NCR Region.

Agenda 27.2 : **Confirmation of the minutes of the 26th meeting of Academic Council held on 14.01.2021.**

The minutes of the 26th meeting of the Academic Council held on 14.01.2021, were circulated among all the members vide forwarding no. F.DTU/ORG/AC/ Meeting/01(1)/ 2010/Vol-XII/2313-26 dated 18.01.2021.

No comments received from any of the members.

The Academic Council confirmed the minutes of its 26th meeting held on 14.01.2021.

Agenda 27.3 : **Action taken report on the decisions taken in the 26ᵗʰ meeting of the Academic Council.**

Action Taken Report on the decisions taken in the 26ᵗʰ meeting of the Academic Council held on 14.01.2021 was placed before the Academic Council.

No comments have been received.

The Academic Council noted and took the Action Taken Report on record.

Agenda 27.4 : Approval for creation of Department of Software Engineering.

It was submitted to the Academic Council that two programs namely B.Tech in Software Engineering and M.Tech in Software Engineering have been started in 2009 vide 1st Meeting of Board of Management dated 13.10.2009 with an initial intake of 60 and 18, respectively. The programs are being run by the Department of Computer Science & Engineering under the Discipline of Software Engineering and faculty has been recruited from time to time in the Discipline of Software Engineering. In Delhi Technological University, teaching posts are creating discipline-wise after obtaining approval of Government of NCT of Delhi.

Currently, student intake has been increased in B.Tech in Software Engineering to 152 and M.Tech in Software Engineering to 25. The Discipline of Software Engineering has been assigned a separate space in the new upcoming Academic Blocks of Delhi Technological University.

It was proposed that Department of Software Engineering be created and Discipline of Software Engineering and its programs i.e. B.Tech in Software Engineering and M.Tech in Software Engineering and other activities be transferred to the Department of Software Engineering. It is further mentioned that Department of Software Engineering will run B.Tech in Software Engineering, M.Tech in Software Engineering, Ph.D programs and other new programs as decided by the university from time to time. The prime focus of the proposed department will be to produce skilled software engineers/professionals who can develop high quality and cost-effective software systems.

Decision : The Academic Council considered and recommended the creation of Department of Software Engineering to the Board of Management for its approval.

Agenda 27.5 : Approval of Guidelines for creation of Centre of Excellence in the departments of the University.

It was submitted to the Academic Council that an online meeting of following committee constituted by Competent Authority for creation of Centre of Excellence was held on 28.01.2021 and 08.02.2021:

1. Prof A. Trivedi, Dean IRD, Chairperson
2. Prof. Pragati Kumar, Member
3. Prof. Neeta Pandey, Member
4. Dr. Ruchika Malhotra, Associate Dean IRD, Member Secretary

After discussions and deliberations, the guidelines for creation of Centre of Excellence in the departments of the university were created. The same were circulated to Deans and HoDs and further discussed in the meeting of Deans and HoDs chaired by Hon'ble Vice Chancellor on 9.02.2021. Following are the guidelines:

GUIDELINES FOR CREATION OF CENTRE OF EXCELLENCE

1. Introduction

With a view to promote innovation, research and development in multidisciplinary areas at Delhi Technological University (DTU), the university supports the creation of Centre of Excellence (CoE). The CoE shall possess maturity in research and development and promote best practices of research and innovation. The main aim of establishing the CoE is to motivate and facilitate the departments of the university to work together with like-minded faculty members and students in the emerging and thrust areas of research and innovation for achieving excellence in the chosen areas.

The focus of the CoE will be:

- To create a pool of skilled trained manpower in specialized areas to increase the employability of the personnel.
- To facilitate collaborative research amongst the university teachers in multidisciplinary areas of societal and national importance.
- To enhance the quality of undergraduate education by providing the students an opportunity to work on research projects with university teachers.
- To train postgraduate students in advanced areas of research.
- To work on the academic and research strength of the department and may collaborate with other departments as knowledge partners.

2. Definitions

a) **"Board of Management"** means the Board of Management of the university.

b) **"Academic Council"** means the Academic Council of the university.

c) **"CoE"** means a physical center of research that will provide shared research resources and enable the researchers to collaborate across multiple disciplines on areas that are relevant and important.

d) **"Department"** means a department of studies of the university including training and placement.

e) **"University Teacher"** means Professor, Associate Professor, and Assistant Professor working in the university.

f) **"Coordinator"** will be the university teacher responsible for coordinating, monitoring, and executing the activities of the CoE.

g) **"Student"** means an individual who is registered for any degree in the university.

3. Activities of CoE

The major activities of the CoE shall include, but not limited to:

a) It will execute joint research projects

b) It will offer core and elective courses for undergraduate and postgraduate students

c) It will provide resources and facilities to the researchers including Ph.D students working in the similar area.

d) It will execute masters (optional) and Ph.D programs

e) It will allow undergraduate and postgraduate students to work on research projects.

f) It will facilitate experiential learning in collaboration with industry

g) It will organize training programs, development programs, international and national conferences.

4. Characteristics of CoE

The CoE must develop a long-term strategic plan on the focus areas & expected outcomes and must possess the following characteristics:

a) Vision & Strategic Plan
The CoE must develop a long-term, five-year, strategic plan that will serve as a guiding document for the Centre.

b) Funding

To succeed in long-term, the CoE must identify the funding sources such as industry partners, government organizations, or any other sources to maintain good financial health and it does not depend solely on university grants.

c) Areas of Functioning

The areas must be identified according to the demand in the market for the manpower trained by CoE or research output of the CoE based upon the market survey/SWOT analysis.

d) Team size and Experience

The Coordinator shall initiate the proposal and specify the Co-coordinator (if any) along with the details of the team members.

5. Types of Centres

The CoE shall exist at the department level.

6. Eligibility Criteria

A proposal submitted for CoE shall meet the following specified eligibility criteria as required by the guidelines for the grant of CoE.

a) The coordinator of the CoE must be a regular teacher of the university and must have a proven track record in the proposed area.

b) The proposed CoE has collaboration and obtained funding from an external agency (such as industry partners, government organizations, Research Laboratories of Government of India /States (i.e. CSIR/ DRDO) and other sources) amounting to atleast Rs. 50 Lakhs or as decided by the university from time to time.

c) It is essential to have an MOU with at least one Industry partner that will work as a collaborator in the proposed CoE.

d) At least four university teachers are collaborating in the CoE, out of which three are from the parent department.

7. Financial Assistance from the University

a) Initially, the university shall provide a grant to the CoE with a seed amount of an amount matching the funding drawn from the industry partner, upto five years. The matching grant shall not include a grant for capital creation and equipment. The submission of a satisfactory progress report after two years, the university shall consider providing additional grants to the CoE upto the amount of the funding drawn from the industry partner, depending upon the output of the CoE (such as product development or patents or SCIE/SSCI journal publications produced).

b) For the proposals having grants obtained from the Government agencies, the matching grant will only be given by the university in exceptional cases as decided by the Vice Chancellor.

c) If the industry partner agrees to support the CoE beyond this period, the university shall consider to extend it for a period mutually decided by the industry partner and the university.

d) The grant obtained from the university will be used only for the following activities at the CoE:
   i. Conducting project-oriented collaborative academic/ research activities
   ii. Meeting the equipment/ library resources and operating expenses.
   iii. Conducting faculty development programmes, training programs, conferences, workshops and related events

   This grant will not be used for:
   i. Building construction and/or developing physical infrastructure
   ii. Attending international/national conferences

e) In addition to the above grant, the following will be done by the university:
   i. Maintenance and creation of infrastructure of CoE
   ii. DTU Research fellowships as per availability and requirement for CoE as decided by the Vice Chancellor.
   iii. Support staff (atleast one MTS) will be provided by the university.
   iv. Technical staff will be provided by the department as decided by the Head of Department.

f) The expenditure on the salary of additional academic/ research staff as engaged by the CoE from time to time shall not exceed 20% of the DTU grant and 20% or more from the external funding as decided by the funding agency.

g) There may be a separate Purchase Committee for Centre of Excellence, as approved by the Vice Chancellor.

8. Evaluation of Proposals of the CoE

A **Standing Committee** would consider the proposals received by various university teachers and short list the proposals as per the prescribed eligibility criteria by calling the applicants for presentation. The presentation and proposal must be developed by the proposed coordinator as per the guidelines given in Point 4 of this document. The composition of the Standing Committee will be as follows and will be nominated by the Vice Chancellor:

a) A senior academician: Chairperson
b) An academician of repute from within university: Member
c) An academician of repute from outside university: Member
d) Head of the participating Department(s): Member
e) An academician from within university: Member Secretary

The proposals recommended by the standing committee shall be considered by the Academic Council. The Board of Management shall approve the proposal on the recommendation of the Academic Council.

9. Monitoring Committee

A monitoring committee will be formed for midterm evaluation and progress of the performance of the CoE. The composition of the Monitoring Committee will be as follows and will be nominated by the Vice Chancellor:

a) A senior academician: Chairperson
b) An academician/expert of repute from within university: Member
c) An academician/expert of repute from outside university: Member
d) Head of the participating Department(s): Member
e) An academician from within university: Member Secretary

10. Advisory Committee

An advisory committee will be formed to oversee the initiation and implementation of various activities and programs at the CoE. The composition of the Advisory Committee will be as follows and will be nominated by the Vice Chancellor:

a) Vice-Chancellor or his nominee: Chairperson
b) An academician of repute from within university: Member
c) An academician of repute from outside university: Member
d) Head of the participating Department(s): Member
e) Coordinators of CoE of the participating departments: Members

11. Procedure for Release of Grants

The 60% of the grant will be released by the university in the first year and subsequent grants will be released on the recommendation of the monitoring committee.

12. Procedure for Monitoring the Progress

Each CoE will be required to submit an Annual Report of work done during the previous financial year, to the IRD Division, latest by 30th April of every year.

The progress made by each CoE will be reviewed, monitored and evaluated at the end of each year with the help of the Monitoring Committee. The Coordinator of the CoE will make a presentation before the Monitoring Committee, highlighting the achievements of the Centre in light of the objectives set forth.

The Standing Committee will consider the Monitoring Committee Reports of all the Centres and forward its recommendations to the Dean IRD. These may include the need for mid-course correction in the Action Plan and/or Research programme, revision of the budget if required, further release of grant, and related items.

13. Power to Remove Difficulties

If any difficulty arises in giving effect to the provisions of these guidelines, the Vice Chancellor may make such provisions, not inconsistent with the provisions in these guidelines, as appear to be necessary or expedient for removing the difficulty.

Notes:

1. The focus of the centre should remain high quality research and in no case, it should get involved with routine testing and monitoring like third party consultancy assignments.

2. The proposals created for establishing the CoE on call issued by Government of India or Government of NCT of Delhi can be submitted after taking No Objection Certificate by the university. If these proposals are approved, then the CoE will be governed under these guidelines.

3. The assets created under CoE shall be property of the university and shall be non- transferable to any other institution, or as agreed by the sponsoring agency and the University.

Decision : **The Academic Council considered modified the Guidelines for Creation of Centre of Excellence as above and recommended to the Board of Management for its approval.**

Agenda 27.6 : Approval for including new Foundation Elective Courses for UG students.

It was submitted to the Academic Council that it is essential to develop a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

For this purpose, two foundation elective courses (FECs) are being proposed to be introduced to the basket of already existing 55 foundation electives which are being offered to the students of B.Tech. programme from 2018 onwards.

1. FEC-56 "UNIVERSAL HUMAN VALUES: UNDERSTANDING HARMONY"

Developed by AICTE with an intention to be taught to the students throughout the country, this course will provide a much needed orientational input in value education to the young enquiring minds.

2. FEC-57 "LEADERSHIP MASTERY THROUGH SELF MANAGEMENT"

This course has been developed by "Heartfulness Institute" the DTU has made a MoU with, for imparting techniques and methods to realize true human potential and thereby becoming a better professional.

The Teaching and evaluation scheme for Foundation Electives and syllabi will be is as under:

1. FEC 56

Course Title - UNIVERSAL HUMAN VALUE: UNDERSTANDING HARMONY

Scheme and Credits	L	T	P	C
	2	0	0	2

Syllabus:

Introduction to Value Education - Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations.

Harmony in the Human Being - Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health.

Harmony in the Family and Society - Harmony in the Family – the Basic Unit of Human Interaction, Values in Human-to-Human Relationship, 'Trust' – the Foundational Value in Relationship , 'Respect' – as the Right Evaluation, Understanding Harmony in the Society, Vision for the Universal Human Order.

Implications of the Holistic Understanding – a Look at Professional Ethics - Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Holistic Technologies, Production Systems and Management Models- Typical Case Studies, Strategies for Transition towards Value-based Life and Profession.

READINGS:

The Textbook : *A Foundation Course in Human Values and Professional Ethics*, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.

The Teacher's Manual: Teachers' Manual for *A Foundation Course in Human Values and Professional Ethics*, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2.

Reference Books
1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal

9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

2. FEC 57

Course Title - LEADERSHIP MASTERY THROUGH SELF MANAGEMENT

Syllabus:
Discovering oneself, Healthy life style, Time Management, Befriending stress, peak performance, Situational awareness, Peaceful conversation, Heartful conversation, Silence is the language of heart, Science and Art behind meditation (Habits change, observation, Rejuvenation) , Evolution through meditation, Live light and Live right, The power of pause, Transform your relationship, Character and life style. Detox Practices. (Removal of anger, fear, stress and addictions). Power of Self Discipline.

Reference:

1. Designing Destiny By Kamlesh D Patel , Westland Publication, Chennai
2. The Way of the Heart, Spiritual Hierarchy Publication Trust, Kolkatta
3. A Cognitive Approach to Situation Awareness: Theory and Application by Sébastien Tremblay
4. The Upside of Stress Kelly McGonigal
5. No Excuses! The Power of Self-Discipline for Success in Your Life by Brian Tracy and Gildan Media, LLC
6. Peak Performance: Elevate Your Game, Avoid Burnout, and Thrive with the New Science of Success by Brad Stulberg, Steve Magness, et al.
7. Eat. Sleep. Move. Breath: The Beginner's Guide to Living A Healthy Lifestyle by Lars Thestrup , Jennifer Pfleghaar, et al. | Nov 3, 2020
8. Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones by James Clear | Oct 16, 2018
9. Peaceful Conversations - Preventing Conflict in Communication: Across cultures, In the workplace, Among family & friends by Gail Nemetz Robinson PhD | Mar 7, 2017

Decision : **The Academic Council considered and approved to include new Foundation Elective Courses for UG students.**

Agenda 27.7 : Approval for Academic Calendar for B.Tech., B.Tech. (Cont. Edu.), B.A (H) Economics and B.B.A. 2nd Semester (Academic Year-2020-2021).

It was submitted to the Academic Council that Academic Calendar for B.Tech., B.Tech. (Cont. Edu.), B.A (H) Economics and B.B.A. 2nd Semester (Academic Year-2020-2021) have been prepared by the University and are placed below for approval of the Academic Council.

Academic Calendar for B.Tech., B.Tech. (Cont. Edu.) 2nd Semester (Academic Year: 2020-21)

S.No.	Activity	Date
1.	Filling of Online Registration	20.03.2021 to 05.04.2021
2.	Teaching Starts	**05.04.2021**
3.	Surprise Tests I & II	On any working day without prior information to xc the Students
4.	Submission of Proposal of Innovative Work* to the concerned faculty for **MTE component** for courses having **ETE**	10.05.2021
5.	Submission of Proposal of Innovative Practical Work* to the concerned faculty for **PRS component** for courses having **PRE**	
6.	Class Test – I & Practical Test – I (On any working day **with prior information** to the Students)	Between 03.05.2021 & 13.05.2021
7.	1st Review of Innovative Work* for **MTE** components for courses having **MTE**	10.06.2021
8.	1st Review of Innovative Practical Work* for **PRS** components for courses having **PRE**	
9.	Class Test – II & Practical Test – II (On any working day **with prior information** to the Students)	Between 14.06.2021 & 25.06.2021
10.	Submission & Evaluation of Innovative Work* for **MTE** component for courses having **MTE**	Between 05.07.2021 & 16.07.2021
11.	Submission & Evaluation of Innovative Practical Work* for **PRS** component for courses having **PRE**	
12.	Class Test – III & Practical Test – III (On any working day **with prior information** to the Students)	Between 12.07.2021 & 23.07.2021
13.	Teaching Ends	23.07.2021
14.	Online Submission of Marks of All Components of Evaluation	25.07.2021 (Action: Faculty)
15.	Online Submission of Grades to Examination Branch by Course Coordinators	26.07.2021 (Action: Course Co-ordinator)
16.	Declaration of Results	30.07.2021

Academic Calendar for B.A (H) Economics and B.B.A. 2nd Semester (Academic Year: 2020-21)

S.No.	Activity	Date
1.	Filling of Online Registration	**08.03.2021 to 12.03.2021**
2.	Teaching Starts	**15.03.2021**
3.	Surprise Tests I & II	On any working day **without prior information** to the students
4.	Submission of Proposal of Innovative Work* to the concerned faculty for **MTE component** for courses having **ETE**	**09.04.2021**
5.	Submission of Proposal of Innovative Practical Work* to the concerned faculty for **PRS component** for courses having **PRE**	
6.	Class Test – I & Practical Test – I (On any working day **with prior information** to the students)	**Between 12-04-2021 & 23-04-2021**
7.	1st Review of Innovative Work* for MTE components for courses having **MTE**	**10.05.2021**
8.	1st Review of Innovative Practical Work* for **PRS** components for courses having **PRE**	
9.	Class Test – II & Practical Test – II (On any working day **with prior information** to the Students)	**Between 24-05-2021 & 04-06-2021**
10.	Submission & Evaluation of Innovative Work* for **MTE** component for courses having **MTE**	**Between 07-06-2021 & 16-06-2021**
11.	Submission & Evaluation of Innovative Practical Work* for **PRS** component for courses having **PRE**	
12.	Class Test – III & Practical Test – III (On any working day **with prior information** to the Students)	**Between 21-06-2021 & 02-07-2021**
13.	Teaching Ends	07.07.2021
14.	Online Submission of Marks of All Components of Evaluation	14.07.2021 (Action: Faculty)
15.	Online Submission of Grades to Examination Branch by Course Coordinators	23.07.2021 (Action: Course Coordinator)
16.	Declaration of Results	30.07.2021

Decision : **The Academic Council considered and approved the Academic Calendar for B.Tech., B.Tech. (Cont. Edu.), B.A (H) Economics and B.B.A. 2nd Semester (Academic Year 2020-2021).**

Agenda 27.8 : To consider guidelines for the award of Gold Medal in UG and PG programmes.

It was submitted to the Academic Council that recommendations of the duly constituted committee by the Competent Authority to formulate the guidelines for the award of Gold Medal in UG and PG programmes in its online meeting held on 02.02.2021 at 6 p.m. on Google Meet. The Committee took the cognizance of the existing guidelines and recommended to add the following:

The candidate(s) must have passed the examination in the minimum prescribed duration* of the programme as mentioned in the respective ordinances of UG/PG Programmes, passing all the courses in first attempt per semester and year wise.

> * *4 years for B.Tech Programmes: 3 years for BBA/BA (Economics):*
> *2 years for MBA/M.Tech/M.Sc. Programmes or minimum prescribed*
> *duration of the programme.*

This clause may be treated as addendum to the existing guidelines for the award of Gold Medal.

Decision : The Academic Council may consider and modified the existing guidelines for the award of Gold Medal in UG and PG programmes as above. The Council further recommended to place the proposal before the Board of Management for its approval.

Agenda 26.9 : Formal registration of Ph.D. Students upon successful completion of course work and comprehensive examinations and approval of research Plan by respective DRCs.
(To be presented by Dean, Academic- PG)

It was submitted to the Academic Council that Dean Academic (PG) has forwarded a list of **30 candidates** to consider their registration for Ph.D. candidature upon successful completion of course work and comprehensive examinations and approval of Research Plan by respective DRCs. List of the candidates (department-wise) is placed below:

Department of Applied Chemistry

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Saurav Kumar	2K18/PHDAC/503	Applied Chemistry	30.12.2020
2	Saroj Paneru	2K18/PHDAC/04	Applied Chemistry	08.02.2021

Department of Applied Physics

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Rajesh Kumar	2K18/PHDAP/511	Applied Physic	28.12.2020
2	Km. Komal	2K18/PHDAP/09	Applied Physic	15.01.2021
3.	Vishal Singh	2K18/PHDAP/19	Applied Physic	14.01.2021
4	Kanika Sharma	2K18/PHDAP/16	Applied Physic	22.01.2021
5	Richa	2K18/PHDAP/27	Applied Physic	11.02.2021
6	Rashi Mann	2K19/PHDAP/05	Applied Physic	16.02.2021
7	Yash Pathak	2K19/PHDAP/505	Applied Physic	16.02.2021

Department of Biotechnology

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Poonam	2K18/PHDBT/14	Biotechnology	26.10.2020

Department of Civil Engineering

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Devesh Tyagi	2K18/PHDCE/05	Civil Engg.	05.11.2020
2	Mansi Aggarwal	2K18/PHDCE/06	Civil Engg.	16.10.2020
3.	Nerusupalli Dinesh Kumar Reddy	2K18/PHDCE/01	Civil Engg.	30.12.2020

Department of Design

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Mohd. Tayyab	2K19/PHDDES/05	Design	30.01.2021

Department of DSM

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Yashdeep Singh	2K18/PHDDSM/08	DSM	03.12.2020
2	Mohit Beniwal	2K18/PHDDSM/07	DSM	08.07.2020

Department of Electrical Engineering

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Arvind Goswami	2K19/PHDEE/06	Electrical Engg.	30.12.2020
2	Bhavya Bansal	2K19/PHDEE/05	Electrical Engg.	03.02.2021
3	Sumit Maheshwari	2K18/PHDEE/19	Electrical Engg.	07.08.2020

Department of Environmental Engineering

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Anjesh Garg	2K18/PHDEN/04	Environmental Engg.	7.01.2021

Department of Mechanical Engineering

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Ashutosh Mishra	2K18/PHDME/506	Mechanical	18.12.2020
2.	Niranjan Sahoo	2K19/PHDME/14	Mechanical	10.10.2020
3.	Saket Kumar	2K18/PHDME/501	Mechanical	28.01.2021
4.	Neeraj Kumar	2K18/PHDME/39	Mechanical	06.01.2021
5.	Surbhi Upadhyay	2K18/PHDME/38	Mechanical	08.01.2021
6.	Mr. Ashish Kumar Singh	2K18/PHDME/529	Mechanical	18.01.2021

Department of USME

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Shubham Singhania	2K18/PHDUSME/503	USME	31.10.2020
2	Varsha Sehgal	2K18/PHDUSME/05	USME	31.10.2020

Department of Information Technology

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Ankit Yadav	2K19/PHDIT/01	Information Technology	21.12.2020

Department of Humanities

Sr. No.	Name of the Candidate	Roll No	Name of the Department	Date of the SRC
1	Bithika Gorai	2K19/PHDHU/503	Humanities	28.12.2020

Decision : The Academic Council considered and approved candidacy for Ph.D degree to the above 30 candidates for Ph.D. program.

Agenda 27.10 : Approval for admissions in Ph.D for the students admitted in January, 2021.

It was submitted to the Academic Council that 110 candidates have been admitted in different Ph.D programs during January 2021. The list of the admitted students for the different Ph.D programs is given in *Annexure at pages 01 to 04.*

Decision : The Academic Council approved 110 Ph.D admissions in January 2021.

Agenda 27.11 : Cancellation/Withdrawal of admissions made during January to February 2021 from Ph.D. programme.

It was submitted to the Academic Council that the certain admissions have been withdrawn during January-February 2021 from Ph.D programme. The list of the students who cancelled their registration is given below:

S. NO.	ROLL NO.	FULL NAME	DEPARTMENT
1.	2K18/PH.D./USME/04	Ms. Komal	USME
2.	2K18/PH.D./EC/03	Mr. Sudhir	ECE
3.	2K16/PH.D/AC/01	Mr. Mange Ram Mangyan	APPLIED CHEMISTRY

Decision : The Academic Council approved the cancellation of admissions of two students and accepted the request of Mr. Mange Ram Mangyan for continuation of his Ph.D programme.

Agenda 27.12 : Approval for Syllabus of MSCH-107 for M.Sc. Chemistry program.

It was submitted to the Academic Council that the syllabus of M.Sc. Chemistry program was approved by the Academic Council in its 23rd meeting except for the course MSCH-107 (Agenda 23.24). The syllabus for the course MSCH-107a Mathematics for Chemist / MSCH-107b Biology for Chemist (2 credit) and MSCH-107c Good Laboratory Practices and Chemical Safety (2 credit) is recommended by Board of Studies, Applied Chemistry to place the same before the Academic Council for approval.

It was also submitted to the Academic Council for approval of the Syllabus of MSCH-107a Mathematics for Chemist/ MSCH-107b Biology for Chemist and MSCH-107c Good Laboratory Practices and Chemical Safety of M.Sc. Chemistry program. The detailed syllabus is placed in *Annexure at pages 05 to 07*.

Decision : **The Academic Council considered and approved the Syllabus of MSCH-107 for M.Sc. Chemistry program in principle and advised that a committee already constituted for M.Sc. programmes may look in to the change of nomenclature for this course. The Council further authorized Vice Chancellor to accept the recommendations of the Committee.**

Agenda 27.13 : Approval for Electives to be offered under "Minor in Innovation and Entrepreneurship" for B.Tech students in DTU.

It was submitted to the Academic Council that the Department of Delhi School of Management (DSM) has proposed the following minors to be offered to the B.Tech students of the University. The following list of minors has been recommended by an Expert Committee constituted for the purpose and subsequently discussed and approved by the members of Board of Studies of Delhi School of Management:

		List of Core and Electives to be offered under "Minor in Innovation and Entrepreneurship" for B. Tech students of DTU
1.	AE-430	Product Design & Development (Elective)
2.	CO-408	Intellectual Property Rights (Elective)
3.	FB-404	Government Policies, Institutions and Economic Zones for Entrepreneurship (Elective)
4.	FIE-1	International Entrepreneurship (Elective)
5.	FSE-5	Venture Capital Investment (Elective)
6.	BBA - 201	Organizational Behaviour (Elective)
7.	BBA- 202	Marketing Management (Elective)
8.	BBA - 211	Human Resource Management (Elective)
9.	BBA -302	Financial Management (CORE)
10.	BBA 303	Entrepreneurship Development (CORE)
11.	MGT-17	Business Communication (Elective)
12.	MGT-28	Information Technology and Innovation Management (CORE)
13.	MGK-01	Knowledge Creation, Critical Thinking and Innovation (Elective)
14.	MGM-10	Digital Marketing (Elective)
15.	MGM-12	Entrepreneurial Marketing and Sales (Elective)
16.	MBE ALS1	**Action Learning Segment-1** (Elective) **Start-up/Incubation/Acceleration Residency Learning Program : Action Based** **Action Based Learning on** <Market Research & Customer Feedback> <Innovation and Business Model Validation> <Dummy Business & Service Portfolio Build> <Fund & Resource Generation Strategy> <Managing Resources in Start-up Environment>

Decision : The Academic Council considered and approved in principle the Electives to be offered under "Minor in Innovation and Entrepreneurship" for B.Tech students in DTU. The Council further advised that the minor MBE ALS1 should be divided into two segments of 4 credits each as Action Learning Segment-1

and Action Learning Segment-2. The Council also advised that Electives at S.No. 10 and 16 should be treated as Core Course and S.No. 9 and 12 as Electives. The Academic Council further suggested that two more Elective courses namely "Creativity" and "Design Thinking" be also added.

Further the Council authorized the Vice Chancellor to accept the changes.

Agenda 27.14 : Approval of Annual Report 2019-20 of the University.

It was submitted to the Academic Council that the Internal Quality Assurance Cell (IQAC) has compiled the Annual Report for the Academic Year 2019-20 (for the period from 1st August 2019 to 31st July 2020). The Annual Report contained the achievements of the University in various areas of discipline like research, publications, innovation and annual accounts etc.

The Annual Report of the University was tabled on the day of meeting.

Decision : The Academic Council considered and accepted the Annual Report 2019-20 in principle. The Academic Council further constituted a committee under the Chairmanship of Director, IQAC to examine the contents of the Annual Report and recommend to place the Annual Report 2019-20 of the University to the Board of Management for its approval. The following are the members of the committee:

1. Director, IQAC-Chairperson
2. Dean, Academic-UG
3. Dean, Academic-PG
4. Dean, IRD
5. Prof. R.S. Mishra
6. Prof. Narendra Kumar-II

Further the Academic Council authorized Vice Chancellor to accept the changes for placing the matter to the Board of Management.

Agenda 27.15   :   Any other item with the permission of the Chair.

No other mater discussed.

The meeting ended with a vote of thanks to all the members and special invitees.

(Prof.Samsher)
Registrar

Copy to:
1. Pr. Secretary to Hon'ble Lt. Governor (Delhi), 6, Raj Niwas, Civil Lines, Delhi.
2. PA to V.C. for kind information of the Vice Chancellor, DTU.
3. All Deans, DTU.
4. Prof. J.P. Saini, Vice Chancellor, Netaji Subhash University of Technology, Sector 3, Dwarka, Delhi 110078
5. Prof. Neharika Vohra, Vice Chancellor, Delhi Skill & Entrepreneurship University, Dwarka, Delhi.
6. Prof. D.P. Goyal, Director, Indian Institute of Management, Shilong.
7. Prof. B.R. Chahar, Professor, Civil Engineering, Indian Institute of Technology, Delhi (nominee of All India Council for Technical Education)
8. Prof. Bhim Singh, Electrical Engineering Departmeny, Indian Institute of Technology, Delhi
9. All Heads of Department, DTU.
10. Prof. Reeta Wattal, Professor, Mechanical Engineering Department
11. Prof. V.K. Minocha, Professor, Civil Engineering Department
12. Sh. Rajesh Birok., Associate Professor, Electronics and Communication
13. Dr. M. Jayasimhadri, Assistant Prof., Applied Physics Department.
14. Controller of Examinations.
15. Registrar, DTU

(Prof.Samsher)
Registrar

ANNEXURE
for
Minutes

27th meeting of

Academic Council

DTU

19-02-2021

DTU Campus, Shahbad Daulatpur, Bawana Road, Delhi-110042

The list of admitted students for the Ph.D. programme is given below:

S. No.	Roll No.	Full Name	Department
1	2K20/PHDAC/501	DIVYA HUDDA	Applied Chemistry
2	2K20/PHDAC/502	AMAN NIMBHAL	Applied Chemistry
3	2K20/PHDAC/503	RITU SHARMA	Applied Chemistry
4	2K20/PHDCH/501	DAAN KAUR	Applied Chemistry
5	2K20/PHDCH/502	VIKRAM CHOPRA	Applied Chemistry
6	2K20/PHDAM/501	VINITA KHATRI	Applied Mathematics
7	2K20/PHDAM/502	DEEKSHA TOMER	Applied Mathematics
8	2K20/PHDAM/503	ARCHANA YADAV	Applied Mathematics
9	2K20/PHDAP/501	VARNAM SHERAWAT	Applied Physics
10	2K20/PHDAP/502	ANSHUL	Applied Physics
11	2K20/PHDAP/503	INDRAJEET MAURYA	Applied Physics
12	2K20/PHDAP/504	RAMESH KUMAR	Applied Physics
13	2K20/PHDAP/505	MAYANK KUMAR PANDEY	Applied Physics
14	2K20/PHDAP/506	SHAVETA	Applied Physics
15	2K20/PHDAP/507	REKHA SINGH	Applied Physics
16	2K20/PHDCE/501	REEMA KASERA	Civil Engineering
17	2K20/PHDCE/502	YAKSHANSH KUMAR	Civil Engineering
18	2K20/PHDCE/503	VIVEK YADAV	Civil Engineering
19	2K20/PHDCE/504	ANKIT KUMAR	Civil Engineering
20	2K20/PHDCE/505	PRASHANT SAXENA	Civil Engineering
21	2K20/PHDCE/506	DHARMENDRA KUMAR	Civil Engineering
22	2K20/PHDCE/507	ANKITA SONKAR	Civil Engineering
23	2K20/PHDCE/508	SARMISTHA RUDRA PAUL	Civil Engineering
24	2K20/PHDCE/509	C ARUMUGAM	Civil Engineering
25	2K20/PHDCE/510	RAHUL KUMAR	Civil Engineering
26	2K20/PHDCE/511	ANUKUL SAXENA	Civil Engineering
27	2K20/PHDCE/512	REENU VERMA	Civil Engineering

28	**2K20/PHDCE/513**	**MOTEB MAREI**	Civil Engineering
29	2K20/PHDCO/501	SHAHNAWAZ ALAM	Computer Science & Engg.
30	2K20/PHDCO/502	DIKSHA CHAWLA	Computer Science & Engg.
31	2K20/PHDCO/503	SUNITA KUMARI	Computer Science & Engg.
32	2K20/PHDCO/504	PARUL SHARMA	Computer Science & Engg.
33	2K20/PHDCO/505	DIPIKA JAIN	Computer Science & Engg.
34	2K20/PHDCO/506	VISHAL SHARMA	Computer Science & Engg.
35	2K20/PHDCO/507	ANKUR	Computer Science & Engg.
36	2K20/PHDCO/508	RASHMI YADAV	Computer Science & Engg.
37	2K20/PHDCO/509	POONAM RANI	Computer Science & Engg.
38	2K20/PHDCO/510	ASHUTOSH PANDEY	Computer Science & Engg.
39	2K20/PHDCO/511	PALLAVI RANJAN	Computer Science & Engg.
40	2K20/PHDCO/512	PRIYA SINGH	Computer Science & Engg.
41	2K20/PHDEE/501	CHETAN GUSAIN	Electrical Engineering
42	2K20/PHDEE/502	RANJEET SINGH	Electrical Engineering
43	2K20/PHDEE/503	MANVI MISHRA	Electrical Engineering
44	2K20/PHDEE/504	ASHUTOSH	Electrical Engineering
45	2K20/PHDEE/505	MD MODASSIR MASOOM	Electrical Engineering
46	2K20/PHDEE/506	POONAM	Electrical Engineering
47	2K20/PHDEE/507	SHALU	Electrical Engineering
48	2K20/PHDEE/508	PRASHANT KUMAR	Electrical Engineering
49	2K20/PHDEE/509	SHOBANA.R	Electrical Engineering
50	2K20/PHDEE/510	RAJNEESH KUMAR GAHLOT	Electrical Engineering
51	2K20/PHDEE/511	AVINASH	Electrical Engineering
52	2K20/PHDEE/512	LIPIKA DATTA	Electrical Engineering
53	2K20/PHDEE/513	POOJA SHARMA	Electrical Engineering
54	**2K20/PHDEE/514**	**TAMER I. A. ABUDABBO USA**	Electrical Engineering
55	2K20/PHDEC/501	SURESH ANGADI	Electronics & Communication Engg.

56	2K20/PHDEC/502	BHAGYALAKSHMI NARAYANAPURAM	Electronics & Communication Engg.
57	2K20/PHDEC/503	ROHIT SURESH KHANDEKAR	Electronics & Communication Engg.
58	2K20/PHDEC/504	AASHANIA ANTIL	Electronics & Communication Engg.
59	2K20/PHDEC/505	LAVITA	Electronics & Communication Engg.
60	2K20/PHDEC/506	ROLI KUSHWAHA	Electronics & Communication Engg.
61	2K20/PHDEC/507	NEHA SHARMA	Electronics & Communication Engg.
62	2K20/PHDEC/508	HEMANSHI CHUGH	Electronics & Communication Engg.
63	2K20/PHDEC/509	M GANESH	Electronics & Communication Engg.
64	2K20/PHDEC/510	KAVITA BHATT	Electronics & Communication Engg.
65	2K20/PHDEC/511	SHIKHA SINGHAL	Electronics & Communication Engg.
66	2K20/PHDEC/512	AMIT KUMAR DWIVEDI	Electronics & Communication Engg.
67	2K20/PHDEC/513	SUCHI YADAV	Electronics & Communication Engg.
68	2K20/PHDEC/514	RUCHI	Electronics & Communication Engg.
69	2K20/PHDEC/515	KULDEEP SINGH	Electronics & Communication Engg.
70	2K20/PHDEN/501	RADHEYSHYAM	Environmental Engineering
71	2K20/PHDEN/502	DEEPIKA	Environmental Engineering
72	2K20/PHDEN/503	RACHNA GARG	Environmental Engineering
73	2K20/PHDEN/504	LAVI DHIMAN	Environmental Engineering
74	**2K20/PHDEN/505**	**Majed Ibrahim Issa Al-Sari**	Environmental Engineering
75	2K20/PHDIT/501	Somya Chauhan	Information Technology
76	2K20/PHDIT/502	ANUSHA CHHABRA	Information Technology
77	2K20/PHDME/501	PRIYA	Mechanical Engineering
78	2K20/PHDME/502	VIBHU SINGH	Mechanical Engineering
79	2K20/PHDME/503	Soni Kesarwani	Mechanical Engineering
80	2K20/PHDME/504	Aseem Dubey	Mechanical Engineering
81	2K20/PHDME/505	Anand Kushwah	Mechanical Engineering

82	2K20/PHDME/506	Rohit Sahu	Mechanical Engineering
83	2K20/PHDME/507	Shailendra Kumar Gaur	Mechanical Engineering
84	2K20/PHDME/508	SUBHAJIT KONAR	Mechanical Engineering
85	2K20/PHDME/509	MANISH MISHRA	Mechanical Engineering
86	2K20/PHDME/510	VIJAY SHEKHAR SHARMA	Mechanical Engineering
87	2K20/PHDME/511	SACHIN KUMAR	Mechanical Engineering
88	2K20/PHDME/512	BANDLA SESHAVENKAT NAIDU	Mechanical Engineering
89	2K20/PHDME/513	VIPIN KUMAR	Mechanical Engineering
90	2K20/PHDDSM/501	KUMAR MANASWI	Delhi School of Management
91	2K20/PHDDSM/502	PRIYANKA AGGARWAL	Delhi School of Management
92	2K20/PHDDSM/503	PALLAVI SETHI	Delhi School of Management
93	2K20/PHDDSM/504	NISHANT KULSHRESTHA	Delhi School of Management
94	2K20/PHDDSM/505	SANJEEV KUMAR RANA	Delhi School of Management
95	2K20/PHDDSM/506	H.RAJESH PRASAD	Delhi School of Management
96	2k20/PHDDSM/507	AZIMUL HAQUE	Delhi School of Management
97	2K20/PHDUSME/501	PIYUSH KUMAR	USME
98	2K20/PHDUSME/502	SHILPI GUPTA VIJAY	USME
99	2K20/PHDUSME/503	AASHIMA GABA	USME
100	2K20/PHDUSME/504	MEHAK	USME
101	2K20/PHDUSME/505	PAWAN KUMAR	USME
102	2K20/PHDUIEV/501	PRAVEEN MISRA	USME
103	2K20/PHDUECO/501	MANOJ KUMAR	USME
104	2K20/PHDUECO/502	KARAN ANAND	USME
105	2K20/PHDUECO/503	HIMANSHU SINGH	USME
106	2K20/PHDUECO/504	CHARU TAYAL	USME
107	2K20/PHDUECO/505	NEHA NARULA	USME
108	2K20/PHDUECO/506	SURABHI SOUMYA	USME
109	2K20/PHDUECO/507	SANCHITA CHAUDHARY	USME
110	2K20/PHDUECO/508	LAVI VATS	USME

SYLLABUS for MSCH107 (DCC)

1.	**Subject Code: MSCH-107a**	**Course Title: Mathematics for Chemist**
2.	Contact Hours:	L-2 T-0 P-0
3.	Examination Duration (Hrs.):	Theory: 1.5 Hrs.
4.	Relative Weightage:	CWS: 25 PRS: 0 MTE: 25 ETE: 50
5.	Credits:	2
6.	Semester:	ODD
7.	Subject Area:	DCC
8.	Pre-requisite:	Some knowledge of school mathematics
9.	Course Objective:	To impart knowledge of mathematics.
10.	Course Outcomes:	This course will help the students to solve the numerical problem related to chemistry.

11.   Details of Course:

	Course content	Hours
Unit I	**Vector and Scalar:** Definitions of vectors in two, three spaces, representation and simple properties of vectors, vector addition, subtraction, multiplication, and differentiation of vectors. Scalar product of vectors, vector product, concept of normalization, orthogonality and complete set of unit vectors. **Matrix algebra:** Definition and types of matrices, addition, subtraction and multiplication by a number, matrix multiplication. Transpose and adjoint of matrix, elementary transformation, representation and applications to solution of linear equations. Definition of determinant, properties of determinants, evaluation of determinants, Introduction to group theory and properties.	8
Unit II	**Differential calculus:** Introduction of functions, continuity and differentiability, rules for differentiation, applications of differential calculus including maxima and minima. **Integral calculus:** Basic rules for integration, integration by parts, partial fraction and substitution, definite integral and its properties. **Partial differentiation:** Functions of several variables, partial differentiation. **Elementary differential equations:** Variables-separable and exact first order differential equations, homogeneous, exact and linear equations.	12
Unit III	**Permutation and probability:** Permutations and combinations, probability and probability theorems, probability curves. Curve fitting (including least squares fit etc) with a general polynomial fit. **Statistics:** Mean, median, mode, standard deviations, and correlation coefficient, random variables, expectation, variance, normal distribution and student t-test.	8

Recommended Books:
1. Steiner, E. *The Chemistry Mathematics*, 1st edition, Oxford University Press.
2. Doggett; Sucliffe. *Mathematics for Chemistry*, 1st edition, Longman, 2003.
3. Daniels, F. *Mathematical Preparation for Physical Chemistry*, McGraw Hill.
4. Hirst, D.M. *Chemical Mathematics*, Longman.
5. Barrante, J. R. *Applied Mathematics for Physical Chemistry*, 3rd edition, Prentice Hall, 2004.
6. Tebbutt *Basic Mathematics for Chemists*, 1st edition, John Wiley, 1994

1	Subject Code: MSCH-107b	Course Title: Biology for Chemist

2	Contact Hours:	L-2	T-0	P-0
3	Examination Duration (Hrs.):	Theory: 1.5 Hrs.	Practical: 0	
4	Relative Weightage:	CWS: 25	MTE: 25	ETE: 50
5	Credits:	2		
6	Semester:	Iˢᵗ (ODD)		
7	Subject Area:	DCC		
8	Pre-requisite:	Some knowledge of school biology		
9	Course Objective:	To impart knowledge about basics of biology and their importance.		
10	Course Outcomes:	This course will help the students to gain knowledge of biochemistry and use of chemistry in other biological fields.		

	Course content	Hours
Unit I	**Cell structure and function**: Structure of prokaryotic and eukaryotic cells, intracellular organelles and their functions, introduction to biomolecules, building blocks of bio-macromolecules.	6
Unit II	**Carbohydrates**: Conformation of monosaccharides, structure and functions of important derivatives of monosaccharides structural polysaccharides-cellulose and chitin, carbohydrate metabolism-Krebs' cycle, glycolysis, glycogenesis and glycogenolysis, gluconeogenesis, pentose phosphate pathway.	8
Unit III	**Lipids**: Fatty acids, essential fatty acids, structure and function of triacylglycerols, glycerol phospholipids, sphingolipids **Proteins**: Structure of proteins, biosynthesis of amino acids, chemical and enzymatic hydrolysis of proteins to peptides, sequence determination: chemical/enzymatic/ mass spectral/racemization /detection, chemistry of hormones.	8
Unit IV	**Nucleic acids**: Purine and pyrimidine bases of nucleic acids, base pairing via H-bonding, structure of ribonucleic acid (RNA) and deoxyribonucleic acid (DNA), double helix model of DNA and forces responsible for holding it.	6

Recommended Books:
1. Lehninger, A.L. *Principles of Biochemistry*, Worth Publishers.
2. Stryer, L. *Biochemistry*, W.H. Freeman
3. Rawn, J. David *Biochemistry*, Neil Patterson.
4. Voet; Voet *Biochemistry*, John Wiley.
5. Conn, E.E.; Stumpf, P. K. *Outlines of Biochemistry*, John Wiley.

1	Subject Code: MSCH-107c	Course Title: Good Laboratory Practices and Chemical Safety
2	Contact Hours:	L-2 T-0 P-0
3	Examination Duration (Hrs.):	Theory: 1.5 Hrs. Practical: 0
4	Relative Weightage:	CWS: 25 MTE: 25 ETE: 50
5	Credits:	2
6	Semester:	1ˢᵗ (ODD)
7	Subject Area:	DCC
8	Pre-requisite:	Some knowledge of school laboratory
9	Course Objective:	To impart knowledge about good laboratory practices, chemical safety and safe disposal.
10	Course Outcomes:	This course will help the students to gain knowledge of biochemistry and use of chemistry in other biological fields.

	Course content	Hours
Unit I	**Laboratory safety:** Importance of laboratory safety, security, responsibility, personnel clothing, foot protection, eye and face protection, safety shield, fire safety equipments, heat and smoke detector, respirators, safety showers, eye wash unit, types of hazards and risk in chemical laboratory, symbols on chemical bottles/packets, hazard rating systems, First aid.	6
Unit II	**Chemical exposer and safety:** Inhalation, contact with skin and eye, ingestion, assessing risk with acute toxicology, specific chemical hazard, First aid for contact of different chemicals on skin, eyes, and inhalation ingestion. Chemical spills and cleanup. Globally harmonized system of classification & labelling of chemicals (GHS). Interpreting MSDS information.	8
Unit III	**Managing Chemicals:** Green chemistry for every laboratory, purchasing chemicals, inventory and tracking of chemicals, storage of chemicals, transfer, and transport, identifying waste and its hazards, collecting and storing waste, treatment and hazard reduction, disposal options, examples of important laboratory and industrial chemical accidents.	8
Unit IV	**Fire and Explosion:** Flammable and combustible chemicals, Fire diamond, Fire extinguishers, effective ignition source, electricity management, Explosion: BLEVE, VCE, detonation and deflagration, flammability limits, LOC, flash point, flammability diagram, compressed gases.	6

Recommended Books:

1. Jay A. Young, Improving Safety in the Chemical Laboratory: A Practical Guide, Wiley-Interscience
2. Robert H. Hill Jr., David C. Finster, Laboratory Safety for Chemistry Students, Wiley; 2nd edition, (2016)
3. Najat Rashid, Ramnik Sood, Manual of Laboratory Safety (Chemical, Radioactive, and Biosafety with Biocides), JPB; First edition (2013)