

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER



पाठ्यक्रम **SYLLABUS**

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

Post Graduate Diploma in Textile Chemistry Examination

2009-10 से प्रभावी(w.e.f.)

सत्र 2013-14

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

NOTICE

1. Change in Statutes/Ordinances/Rules/Regulations/Syllabus and Books may, from time to time, be made by amendment or remaking, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change. The decision taken by the Academic Council shall be final.

सूचना

1. समय-समय पर संशोधन या पुनः निर्माण कर परिणियमों / अध्यादेशों / नियमों / विनियमों / पाठ्यक्रमों व पुस्तकों में परिवर्तन किया जा सकता है, तथा किसी भी परिवर्तन को छात्र को मानना होगा बशर्ते कि विश्वविद्यालय ने अन्यथा प्रकार से उनको छूट न दी हो और छात्र ने उस परिवर्तन के पूर्व वर्ष पाठ्यक्रम को पूरा न किया हो। विद्या परिषद द्वारा लिये गये निर्णय अन्तिम होंगे।

POST GRADUATE DIPLOMA IN TEXTILE CHEMISTRY

REGULATION AND SCHEME FOR THE POST GRADUATE DIPLOMA IN TEXTILE CHEMISTRY

Regulation

The Examination shall be conducted at end of the academic session as per Scheme of Examination. Minimum Pass Marks in each paper 40% with an aggregate of 50% marks in all the papers for awarding of the Diploma.

The Division will be awarded as follows:

I Division – minimum 60% or above marks in aggregate

II Division – 50 % marks or above but less than 60% in aggregate.

Eligibility for Admission

A graduate of Science with Chemistry at least 50% marks with relaxation in case of reserved candidates may be considered for admission subject to availability of seats and any Admission Test Prescribed by the Dept./ University.

Minimum Pass Marks & Duration of Course

The minimum pass marks required in aggregate are 50% marks subject to a minimum of 40% marks for each paper subject to this provision the minimum requirement for a I division 60% & II division 50%.

The duration of course is spread over on one Academic year. There will be no Supplementary Examination. However if a student fails, maximum one more chance will be given in three Academic Session to pass the examination, but if a student passes in Project Report/ Practical his marks will be carried forward for the next examination and thus he is exempted to reappear in the project report/ practical in the following year(s). Separate pass marks are required in Project report/ Practical. Maximum marks for each paper will be 100. The maximum time allowed for each paper is three hours.

Requirement of Attendance

Minimum 75% Attendance is required.

Examination Fee

Examination fee is prescribed by the University and no carried forward of fee is allowed on any ground.

Scheme of Examination and Course of Studies

There will be four Theory papers and practicals. Each Paper will be of 100 marks and three hours duration.

Paper-I: Chemistry of Fibres

Paper-II: Technology of Bleaching and Finishing

Paper-III: Technology of Dyeing and Printing.

Paper-IV : Computer Programming

Practicals: 200 Marks (12 hours duration in 2 days)
(Including 25 Marks for Seminar/Project Report)

PAPER I: CHEMISTRY OF FIBRES

Max. Marks: 100

3 Hours Duration

Note: Ten question will be set giving two from each unit. Candidate has to answer five question in all taking one question from each unit.

Unit 1

- Chemical structure of cellulose like cotton, jute and wool. Action of different chemicals and reagents on these Fibres.
- General principles involved in the analytical techniques used for the study of textile fibres such as TGA, spectrophotometry, NMR, IR spectroscopy.

Unit 2

Chemical structure of manmade fibres (Rayone, Polyamide, Polyester and Poly acrylonitrile). Synthesis of fibre forming polymers brief idea about commercial production of fibres/yarns and sequence of operations. Effect of acids, alkalies, oxydising agents, reducing agent, solvents, Heat and light on various types of man made fibres.

Unit 3

Physical testing of textiles:

- Fibers: Shape, staple length denier tensile strength elongation moisture regain.
- Yarns, count evenness turns per inch tensile strength elongation.
- Fabric: ends, picks, weight of warp and weft identification of stiffness. Crease recovery, wear tear resistance, air permeability, wrinkle test, Thermal conductivity.

Unit 4

Chemical testing of textile: Determination of ash content% shrinkage, colour fastness of dyed, printed textiles (Light, washing perspiration, rubbing and bleaching) Analysis of blend composition namely cotton/viscose, viscose/acetate, viscose/ nylon, viscose or cotton/polyester, nylon/acrylic viscose/ acrylic and other popular blends.

Unit 5

- Determination of hardness of water, treatment of water to make it suitable for textile industry.
- Analysis of desizing, scouring and bleaching agents, Analysis of dyes, dyeing and printing gums.
- Identification and evaluation of common finishing agents, such as stiffing agents, Softness surface active agents, crease proofing and water proofing chemical etc.

PAPER II: TECHNOLOGY OF BLEACHING AND FINISHING

Max. marks: 100

3 Hours Duration

- Unit 1 Singeing, desizing of various gams. Scouring cotton in kiers and by continuous methods. Scouring of wool and silk
- Unit 2 Bleaching of cotton and rayons with sodium hypochlorite hydrogen peroxide and sodium chloride, Bleaching of wool and silk.
- Unit 3 Scouring and bleaching of synthetic yarn/fabrik and their blends. Use of optical whitening agents in the scouring and bleaching of man made fibre/ Fabrics.
- Unit 4 General introduction about different type of finishes. Application of Temporary and permanent finishes starches gums and softeners, such and Wash N wear finishing, water proofing, fire proofing month proofing etc, Finishing machines covering stretching devices, mangles, washing machines, drying machines damping, calendaring and curing machines etc. mercerization of cotton and its blends.
- Unit 5 Finishing of manmade fibre-fabrics and their blends e.g. heat setting antistatic, of soil release, flame retardant and durable press finishing

Study of finishing compounds and the methods used in laboratory development and commercial application of finishing compounds.

PAPER III: TECHNOLOGY OF DYEING AND PRINTING

Max. marks: 100

3 Hours Duration

- Unit 1 Classification of dyes General idea about chemistry of dyes Application of various dyes to cotton and viscose.
- Unit 2 Dyeing of synthetic fibres. Dyeing of blends of synthetic fibres and cellulosic fibers, Dyeing from organic solvents.
- Unit 3 Various methods of printing, Block printing, Screen printing roller printing, rotary screen cope heat transfer printing, printing of cotton with various dyes by direct style.
- Unit 4 Printing of synthetic fibres and blends Discharge and resist style of printing on cellulosic fibres, synthetic fibres and blends.
- Unit 5 Dyeing of wool and wild, Modern techniques in dyeing and printing of natural and man-made fibres in pure blended forms.

PAPER- IV COMPUTER PROGRAMMING

Time: 3 Hrs.

Max. Marks:100

Unit-I

Introduction to computer, Basic structure and functioning of computer with AFC as an illustrative. Example evolution of computers, classification of computers on the basis of application purpose and size, advantage and disadvantage of computers, application of computers, hardware and software, input-output devices, binary numbers and arithmetic memory I/O device, secondary storage.

Unit-II

Computers language, operating system with DOS as an example introduction to UNIX and Windows. Data processing, principles of programming, algorithms and flow charts.

Unit-III**Computer Programming in C**

Overview of C, constants, variable, and data type, operators and expression managing input and output operator, decision making and branching. IF statement AND FOR statement IF ... ELSE statement GOTO statement decision making and looping, While statement, Do statement and jumps in loop.

Unit-IV**Programming in Chemistry**

Development of small computer codes involving simple formulae in chemistry such as vander waals equation, titration kinetics, radioactive decay.

Unit-V

Evaluation of lattice energy and ionic radii from experimental data, Linear simultaneous equation to solve secular equation within the Huckel Theory elementary structural features such as bond lengths.

PRACTICALS

Time : 12 hrs. Duration two days

Max. Marks:20

Five experiments will be given in the examination: (30 marks for each experiment)

- Testing and complete analysis of chemicals involved in wet processes.
- Preparation of fabrics for dyeing and printing.
- Dyeing of fabrics with different dyes.
- Printing of fabrics with different dyes.
- Identification of fibres.
- Identification of dyes.
- Finishing processing of various fabrics.
- Evaluation of surfactants.
- Damage evaluation fabrics during processing.

10. Determination of hardness of water.
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|------------------------|----------|
| Record | 15 marks |
| Viva | 10 marks |
| Seminar/Project Report | 25 marks |

Book Recommended:

1. Hall, A.J. (8th Edn.) the Standard Hand Book of Textiles Butter Worth. London.
2. Clark, W An Introduction to Textile [romtomg-A practical for use in Laboratories College and school Arts manual bottorwaoth, London.
3. Shinia. V.A. : Technology of Textile Processing Vol.IX Sevak Publication Mumbai.
4. Chabravarty, R.R. Glimpsesof Textile Technology, Caxton Press, Delhi.
5. Hall, A.J.: Textile Finishing, Elsevier.
6. Peters, R.H.: Textile Chemistry , Vol I and Vol II Elsevier Amsterda Analytical methods for textile laboratory IIIrd. Willims Univo fo Delewale, U.S.A.
7. R.S. Proyog technology textile printing,
8. R. S. Prayog Bleaching Marcerising and Dyeing of cotton material.