ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
MANGALORE UNIVERSITY
(Accredited by NAAC with 'A' Grade)

ಕ್ರಮಾಂಕ/ No. : MU/ACC/CR.46/2014-15/A2

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199

ದಿನಾಂಕ/Date: 15.02.2016

NOTIFICATION

Sub : Revised syllabus for Ph.D. Course work in Chemistry
Ref: Academic Council decision No.: 3:20(2015-16), dated 25.01.2016.

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The revised Syllabus for Ph.D Coursework in Chemistry which approved by the Academic Council at its meeting held on 25.01.2016 is hereby notified for implementation with effect from the academic year 2015-16.

REGISTRAR.

To:

1) The Chairmen of P.G. Departments/ Co-ordinators of P.G. Courses/ Principals of the Recognised Colleges/ Directors of Recognised Institutions of Mangalore University.
2) The Chairman, Board of Studies in subject concerned.
3) The Superintendent (ACC), O/o the Registrar, Mangalore University.
4) Guard File.
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MANGALORE UNIVERSITY
DEPARTMENT OF CHEMISTRY,
Mangalagangothri-574199

Ph.D. Course work in Chemistry
Revised Syllabi (Papers-1 & 2)
2015

Mangalore University
Department of Chemistry, Mangalagangothri-574199

Preamble:

As per the letter from the University (No:MU/ACC/CR.46/2014-15/A2 dt.6-3-2015) number of papers for the Ph.D. course work in chemistry has been reduced from the present FOUR to TWO. They are: Paper 1:Research methodology and Paper 2: Review of Literature.

Based on the letter No.MU/ACC/CR 46/2014-15/A2 dt.25-11-2015 the number of hours of instruction for Paper—1 and 2 per week will be 4 and 16hrs respectively, and credit will be 4 and 10 respectively. The total credit will be 14 as shown in below Table.

Papers	Particulars	Hours of Instruction per week	Duration of Exam (hrs)	Marks			
				IA	Theory	Total	Credits
Paper 1	Research methodology	4	3	30	70	100	4
Paper 2	Review of Literature						
	Review Report	16	-	-	-	150	8
	Viva	-	-	-	-	50	2
				Total Credit			14

(Prof. Ishwara Bhat)

Dr. J. ISHWARA BHAT
PROFESSOR OF CHEMISTRY
MANGALORE UNIVERSITY
MANGALAGANGOTHRI - 574 199

Paper -1: CH 601: Research Methodology in Chemistry (56 hrs.)

UNIT-I: Foundation of Research- What is Research? Objectives of Research, Scientific Research, Research and Theory-Conceptual and theoretical Models-Importance of research methodology in scientific research. Research design, Basic Principles- Need of research design, Features of good design, important concepts relating to research design.

Types and Methods of Research, Classification of Research, Pure and Applied Research, Exploring or Formulative Research, Descriptive Research, Diagnostic Research/Study, Evaluation research/Studies, Action Research, Experimental Research-Problem selection, Literature Survey : Sources of information, Need for Reviewing Literature, Primary, Secondary, Tertiary sources, Journals, Journal abbreviations, Abstracts, Current titles, Reviews: Monographs, Dictionaries, Text books, Current contents, Introduction to Chemical Abstracts and Beilstein, Subject Index, Substance Index, Author Index, Formula Index and other Indices with examples. Digital: Web resources, E-Journal, Journal access, TOC alerts. Hot articles: Citation index, Impact factor, H-Index, E-Consortium, UGC infonet, E-Books, Internet discussion groups and communities, Blogs, Preprint server, Search engines, Scirus, Google Scholar, Chemical Industry, Wiki- Databases, ChemSpider, ScienceDirect, SciFinder, Scopus. Familiarity with ideas and concepts of investigation. Field Studies. Planning of Research- The planning process- Selection of a Problem for Research- Formulation of the Selected Problems- Hypothesis formation- Measurement-Research Design/Plan. 14hrs.

UNIT-II: Research problem-Identification, statement of research problem, objectives, design and execution of experiments, collection and interpretation of experimental data, arriving at conclusions. Reporting the results of research-style and format - title, abstract and the text. References, tables, figures, elucidations, quotations and footnote. Writing of monographs, review articles and dissertations.

Sampling Techniques or Methods- Choice of sampling Techniques- Sample size- Sampling and Non-Sampling errors- Estimation of Population and Proportion, Mean- Estimation of Standard Error and Confidence Interval. Errors and statical analysis of Data, Classification of errors, statistical analysis of errors, Curve fitting and Tests of statistical significance. 14hrs.

UNIT-III: Basic knowledge of computer systems, softwares - System software and application software, Programming languages: machine language, assembly language and high level languages. Interpreter and compiler. Flow charts and Algorithms. General awareness of operating systems: Disk operating system, Windows, MaCintosh, Linux. General awareness of Software packages and other scientific application. Application and uses of common softwares in chemistry, Origin, Chemsketch, Chemdraw. Basic ideas on the use of Internet in Chemistry education.

Concepts of Chemical safety- Chemical Safety and Ethical Handling of Chemicals, Safe working procedure and protective environment, protective apparel, emergency procedure and first aid,

laboratory ventilation, Safe storage and use of hazardous chemicals, procedure for working with substances that pose hazards, flammable or explosive hazards, procedures for working with gases at pressures above or below atmospheric, safe storage and disposal of waste chemicals, recovery, recycling and reuse of laboratory chemicals, procedure for laboratory disposal of explosives, identification, verification and segregation of laboratory waste, disposal of chemicals in the sanitary sewer system, in incineration and transportation of hazardous chemicals. 14hrs

UNIT-IV: Advanced Techniques of Analysis and Ethics of Research: Applications of UV-Visible, IR, NMR, Mass, ESR, XRD for the structural elucidation of compounds. COSY, NOSEY, INDOR and DEPT spectra, Thermal analysis and electrowork station.

Ethical issues, ethical committees, Commercialization, Copy right, royalty, Intellectual property rights and patent law, Trade Related aspects of Intellectual Property Rights, Reproduction of published material. Plagiarism. Citation and acknowledgement. Reproducibility and accountability.

Safety rules of laboratory acquaintance of experimental set up and instruments. Intellectual property and intellectual property rights. Environmental impacts, Data management, importance of safety and security of data, evaluation of inventions. Communication with patent council and publication of data, communication with investors, IP sales process. 14hrs

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2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. .
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12. Fundamental of Research Methodology and Statistics, Yogesh Kumar Singh, New Age International Publishers, 2006.
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Paper -2: CH 602: Review of Literature-(3 hrs of Instruction per week)

Content is based on the research field undr the direction of the Research Guide. Content of the Review report shall include the art of research work analysis, related implementation issues and motivation for the stated research work.
