NEW AND RESTRUCTURED POST-GRADUATE CURRICULA & SYLLABI

Forestry

Education Division
Indian Council of Agricultural Research
New Delhi

April 2009

ORGANIZATION OF COURSE CONTENTS
&
CREDIT REQUIREMENTS

Code Numbers

- All courses are divided into two series: 500-series courses pertain to Master's level, and 600-series to Doctoral level. A Ph. D. student must take a minimum of two 600 series courses, but may also take 500-series courses if not studied during Master's programme.
- Credit seminar for Master's level is designated by code no. 591, and the two seminars for Doctoral level are coded as 691 and 692, respectively.
- Similarly, 599 and 699 codes have been given for Master's research and Doctoral research, respectively.

Course Contents

The contents of each course have been organized into:

- Objective – to elucidate the basic purpose.
- Theory units – to facilitate uniform coverage of syllabus for paper setting.
- Suggested Readings – to recommend some standard books as reference material. This does not unequivocally exclude other such reference material that may be recommended according to the advancements and local requirements.
- A list of journals pertaining to the discipline is provided at the end which may be useful as study material for 600-series courses as well as research topics.
- E-Resources - for quick update on specific topics/events pertaining to the subject.
- Broad research topics provided at the end would facilitate the advisors for appropriate research directions to the PG students.

Eligibility for Admission:

(a) Masters degree programme:

1. B.Sc. Forestry (4 years programme)/B.Sc. (Hons.) Forestry
2. In case B.Sc. Forestry/B.Sc. (Hons.) Forestry candidates are not available, B.Sc. Ag./B.Sc. Hort. may be considered.

(b) Doctoral degree programme:

Master's degree in Forestry

Minimum Credit Requirements

Subject	Master's programme	Doctoral programme
Major (Core)	22	15
Minor (Specialization)	12	08
Supporting	05	05
Seminar	01	02
Research	20	45
Total Credits	**60**	**75**
Compulsory Non Credit Courses	See relevant section	

Major subject: The subject in which the student takes admission
Minor subject: In Forestry, the specialization within a major subject is taken as minor.
Supporting subject: The subject not related to the major subject. It could be any subject considered relevant for student's research work.
Non-Credit Compulsory Courses: Please see the relevant section for details. Six courses (PGS 501-PGS 506) are of general nature and are compulsory for Master's programme. Ph. D. students may be exempted from these courses if already studied during Master's degree.

M. Sc. FORESTRY

Course Structure – at a Glance

A. CORE COURSES (MAJOR)

CODE	COURSE TITLE	CREDITS
FOR 501	SILVICULTURE	2+0
FOR 502	FOREST BIOMETRY	1+1
FOR 503	FOREST MANAGEMENT	2+0
FOR 504	FOREST PRODUCTS – CHEMISTRY AND INDUSTRIES	2+1
FOR 505	FOREST ECOLOGY AND BIODIVERSITY CONSERVATION	2+1
FOR 506	FOREST RESOURCE MANAGEMENT AND ECONOMICS	1+1
FOR 507	FOREST PROTECTION	1+1
FOR 508	FOREST POLICY AND LAWS AND INTERNATIONAL CONVENTIONS	2+0
FOR 509	TREE IMPROVEMENT	1+1
FOR 510	FORESTS AND PEOPLE	1+1

B. SUPPORTING COURSES

FOR 511	COMPUTER APPLICATION AND INFORMATION TECHNOLOGY	0+1
FOR 512	REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM	1+1
FOR 513	GENERAL STATISTICAL METHODS AND RESEARCH METHODOLOGY	1+1

D. SPECIALIZATIONS (MINOR)

1. Wood Science and Technology		
WST 521	WOOD IDENTIFICATION	0+2
WST 522	WOOD CHEMISTRY	1+1
WST 523	GENERAL PROPERTIES OF WOOD	1+1
WST 524	WOOD SEASONING & PRESERVATION	2+1
WST 525	PAPER & PULP TECHNOLOGY	2+1
WST 526	WOOD MODIFICATION & COMPOSITE WOOD	2+1
2. Medicinal and Aromatic Plants		
MAP 521	BASICS OF PLANT PRODUCTION AND BREEDING TECHNIQUES	2+1
MAP 522	MEDICINAL CHEMISTRY & PROCESSING OF MAP'S	2+1
MAP 523	BIOTECHNOLOGICAL APPROACHES AND AGRO TECHNIQUES FOR MAP SPECIES.	2+1
MAP 524	IMPROVEMENT OF MEDICINAL AND AROMATIC PLANTS	1+1
MAP 525	ROLE OF MEDICINAL AND AROMATIC PLANTS IN HEALTH CARE SYSTEMS	2+0
MAP 526	PHARMACOGNOSY OF MAP'S	1+1
MAP 527	STUDY TOUR (Visit to Pharmaceutical and Processing Units)	0+1
3. Plantation Technology		
PT 521	SEED COLLECTION, STORAGE AND TESTING	2+1
PT 522	MODERN NURSERY TECHNOLOGY	1+1
PT 523	NUTRIENT & WEED MANAGEMENT IN NURSERY & PLANTATION	2+1
PT 524	MANAGEMENT OF INSECT-PESTS AND DISEASES	1+1
PT 525	ENERGY PLANTATIONS AND BIO-FUELS	1+1
PT 526	PLANTATION FORESTRY	2+1
4. Watershed Management		
WM 521	WATERSHED CONCEPTS, PROJECT FORMULATION AND PLANNING	2+1
WM 522	APPLICATIONS OF REMOTE SENSING AND GIS IN WATERSHED MANAGEMENT	1+1
WM 523	WATERSHED SURVEY, MAPPING AND STRUCTURAL ENGINEERING DESIGNS	2+1
WM 524	WATERSHED HYDROLOGY AND RESOURCES CONSERVATION	2+1
WM 525	PRODUCTION SYSTEM AND BIO-DIVERSITY IN WATERSHED.	3+1
WM 526	PEOPLE'S PARTICIPATION AND IMPACT ANALYSIS IN WATERSHED	2+1

5. Eco-Tourism		
ET 521	ECOTOURISM- CONCEPTS AND MODERN APPROACHES	2+2
ET 522	ECO SYSTEMS OF THE WORLD	2+0
ET 523	ECOTOURISM IN PROTECTED AREAS	2+1
ET 524	ECOTOURISM LANDSCAPING	2+1
ET 525	ECONOMICS OF ECOTOURISM	2+1
ET 526	DESIGN AND MANAGEMENT OF ECOTOURISM	2+1
6. Agro-Forestry		
AF 521	AGROFORESTRY SYSTEMS	2+1
AF 522	SOIL AND WATER MANAGEMENT IN AGROFORESTRY	1+1
AF 523	CROPS AND ANIMALS PRODUCTION MANAGEMENT IN AGROFORESTRY	2+1
AF 524	FRUIT PLANTS, TREES & SHRUBS FOR AGROFORESTRY	2+1
AF 525	ECONOMICS OF AGROFORESTRY SYSTEMS	2+1
AF 526	RANGE LAND AND PASTURE MANAGEMENT	2+0
7. Forest Genetic Resources		
FGR 521	BREEDING METHODS IN FOREST TREES	2+1
FGR 522	REPRODUCTIVE BIOLOGY OF FOREST TREES	2+1
FGR 523	TREE SEED ORCHARDS	2+1
FGR 524	QUANTITATIVE GENETICS IN FOREST TREE BREEDING	3+0
FGR 525	FOREST GENETIC DIVERSITY AND CONSERVATION	3+0
8. Forest Biotechnology		
FB 521	BIOTECHNOLOGY APPROACHES IN FORESTRY	2+1
FB 522	PLANT TISSUE CULTURE	2+1
FB 523	MOLECULAR BIOLOGY	2+1
FB 524	PRINCIPLES & TECHNIQUES IN GENETIC ENGINEERING	2+1
FB 525	ENVIRONMENTAL POLLUTANTS AND BIOTECHNOLOGY	2+0
9. Environment Management		
EM 521	INTRODUCTION TO ENVIRONMENTAL SCIENCES	2+0
EM 522	ENVIRONMENTAL POLLUTION	3+0
EM 523	ENVIRONMENTAL ANALYTICAL TECHNIQUES	2+0
EM 524	GLOBAL CLIMATIC CHANGES	2+0
EM 525	ENVIRONMENTAL POLICY LAW AND INTERNATIONAL CONVENTIONS	3+0
EM 526	ENVIRONMENTAL IMPACT ASSESSMENT	3+0
10. Forest Business Management		
FBM 521	FOREST RESOURCE ANALYSIS	3+0
FBM 522	FINANCE AND MARKETING MANAGEMENT OF FOREST RESOURCES	2+1
FBM 523	FARM MANAGEMENT	3+0
FBM 524	PRODUCTION MANAGEMENT OF NURSERY AND PLANTATION FORESTRY	2+1
FBM 525	PROJECT PLANNING, MONITORING AND EVALUATION	2+1
FBM 526	MANAGERIAL ECONOMICS	3+0

Ph. D. FORESTRY

Course Structure – at a Glance

A. CORE COURSES (MAJOR)

CODE	COURSE TITLE	CREDITS
FOR 601	QUANTITATIVE SILVICULTURE	2+1
FOR 602	ADVANCES IN TREE IMPROVEMENT	2+1
FOR 603	ADVANCES IN WOOD AND NON-WOOD FOREST PRODUCTS	2+1
FOR 604	ADVANCES IN ECONOMIC ANALYSIS IN FORESTRY	2+0
FOR 605	AGROFORESTRY SYSTEMS AND MANAGEMENT	1+1
FOR 606	FORESTRY INTERVENTIONS FOR ENVIRONMENT AMELIORATION	1+1

B. SUPPORTING COURSES

FOR 611	OPERATIONAL RESEARCH IN FOREST MANAGEMENT	2+1
FOR 612	LAND USE PLANNING AND WATERSHED MANAGEMENT	1+1
FOR 613	FOREST ECOLOGICAL MODELING	1+1
FOR 614	ADVANCES IN FOREST BIOMETRICS	1+1
FOR 615	CLIMATE CHANGE AND FORESTRY	1+1
FOR 616	INFORMATION TECHNOLOGY IN FORESTRY	1+1

C. SPECIALIZATION (MINOR)

1. Silviculture		
SILVI 621	ADVANCES IN SILVICULTURE	1+1
SILVI 622	PLANTATION FOREST PRODUCTIVITY	1+1
SILVI 623	FOREST REGENERATION	1+1
SILVI 624	ADVANCES IN FOREST SOIL MANAGEMENT	2+1
SILVI 625	FOREST SEED MANAGEMENT	1+1
2. Forest Genetic Resources		
FGR 621	ADVANCES IN TREE BREEDING	1+1
FGR 622	ADVANCES IN QUANTITATIVE FOREST GENETICS	2+1
FGR 623	FOREST REPRODUCTIVE BIOLOGY	2+1
FGR 624	MOLECULAR GENETICS OF FOREST TREES	2+1
FGR 625	GENETICS OF FOREST ECOSYSTEMS	2+0
3. Wood Science & Technology		
WST 621	ADVANCES IN WOOD TECHNOLOGY	2+1
WST 622	ENERGY AND CHEMICALS FROM WOOD	2+1
WST 623	INSTRUMENTATION IN WOOD SCIENCES	1+2
WST 624	ADVANCES IN WOOD MODIFICATION	2+1
4. Agroforestry		
AF 621	ADVANCES IN AGROFORESTRY RESEARCH & MANAGEMENT	2+0
AF 622	PRODUCTIVITY OF AGROFORESTRY SYSTEM	2+1
AF 623	LAND USE PLANNING AND WATERSHED MANAGEMENT	1+1
AF 624	ADVANCE AGROFORESTRY MANAGEMENT ANALYSIS	1+1
AF 625	ADVANCES IN FOREST SOIL MANAGEMENT	2+1
5. Medicinal and Aromatic Plants		

MAP 621	APPLICATION OF TRADITIONAL KNOWLEDGE	2+0
MAP 622	PRODUCTION OF QUALITY PLANTING MATERIAL	2+1
MAP 623	TECHNOLOGY AND PROCESSING OF MEDICINAL AND AROMATIC PLANTS	2+1
MAP 624	BIOSYNTHETIC ANALYSIS OF SECONDARY METABOLITES	2+1
MAP 625	VALUE ADDITION AND MARKETING OF MEDICINAL AND AROMATICS PLANTS	1+1
6. Forest Biotechnology		
FB 621	ADVANCES IN FOREST BIOTECHNOLOGY	2+1
FB 622	MOLECULAR GENETICS AND GENE MAPPING IN FOREST TREES	2+1
FB 623	MOLECULAR BIOCHEMISTRY	2+1
FB 624	TREE PHYSIOLOGY AND FOREST PRODUCTIVITY	2+1
FB 625	GENETIC ENGINEERING AND BIOINFORMATICS	2+1
7. Natural Resource Economics		
NRC 621	ADVANCED ECONOMETRICS	2+1
NRC 622	NATURAL RESOURCE ECONOMICS	2+0
NRC 623	ENVIRONMENTAL ECONOMICS	2+1
NRC 624	FOREST ECONOMICS	1+1
NRC 625	PROJECT PLANNING AND EVALUATION	1+1

	Specialization Areas	**Possible Discipline of Specialization in M. Sc. Forestry as Feeder**
1.	Silviculture	Plantation Technology, Agroforestry, Environment Management.
2.	Forest Genetic Resources	Forest Genetic Resources, Medicinal Plants, Biotechnology, Agroforestry, Environment Management.
3.	Wood Science & Technology	Wood Science & Technology
4.	Agroforestry	Agroforestry, Medicinal & Aromatic Plants, Forest Genetic Resources, Environment Management.
5.	Medicinal and Aromatic Plants	Medicinal and Aromatic Plants, Agroforestry.
6.	Forest Biotechnology	Forest Genetic Resources, Medicinal Plants, Biotechnology, Agroforestry
7.	Natural Resource Economics	Environment Management, Forest Business Management, Eco Tourism, Agroforestry

COMPULSORY NON-CREDIT COURSES

(Compulsory for Master's programme in all disciplines; Optional for Ph.D. scholars)

CODE	COURSE TITLE	CREDITS
PGS 501	LIBRARY AND INFORMATION SERVICES	0+1
PGS 502	TECHNICAL WRITING AND COMMUNICATIONS SKILLS	0+1
PGS 503 (e-Course)	INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE	1+0
PGS 504	BASIC CONCEPTS IN LABORATORY TECHNIQUES	0+1
PGS 505 (e-Course)	AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES	1+0
PGS 506 (e-Course)	DISASTER MANAGEMENT	1+0

Course Contents

PGS 501 LIBRARY AND INFORMATION SERVICES 0+1

Objective

To equip the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

Practical

Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e-resources access methods.

PGS 502 TECHNICAL WRITING AND COMMUNICATIONS SKILLS 0+1

Objective

To equip the students/scholars with skills to write dissertations, research papers, etc.

To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).

Practical

Technical Writing - Various forms of scientific writings- theses, technical papers, reviews, manuals, etc; Various parts of thesis and research communications (title page, authorship contents page, preface, introduction,