NEHRU GRAM BHARATI VISHWAVIDYALAYA

KOTWA-JAMUNIPUR-DUBAWAL, ALLAHABAD (U.P.)

Syllabus
of
One-Semester (6- months) Certificate course on
"Shri Ganga-Rakshak"

Two-Semester (12- months) Diploma course on
"Shri Ganga Sewak"

Faculty of Science

(Sessoin-2017-18)

(Sem-I)
Common course for Shri Ganga-Rakshak/Ganga Sewak

Sr. No.	Paper	Title	Units	Total Periods	Period			Evaluation Scheme				Subject Total	Credit
								Internal Assessment			ESE		
					L	T	P	CT	TA	Total			
THEORY													
1	I	**Spiritual, Cultural and Modern concept of the Ganga**	5	48	3	1	0	10	10	20	80	100	4
2	II	**Socio-Economic and Cultural Aspects of the Ganga**	5	48	3	1	0	10	10	20	80	100	4
3	III	**Ecology, biodiversity and pollution**	5	48	3	1	0	10	10	20	80	100	4
PROJECT/FIELD WORK													
4	**Project/Field Work**			144	0	0	12				100	100	6
Total					**9**	**3**	**12**	**30**	**30**	**60**	**340**	**400**	**18**

(Sem-II)
Shri Ganga Sewak

Sr. No.	Paper	Title	Units	Total Periods	Period			Evaluation Scheme				Subject Total	Credit
								Internal Assessment			ESE		
					L	T	P	CT	TA	Total			
THEORY													
1	I	**Rejuvenation of the river ganga**	5	48	3	1	0	10	10	20	80	100	4
2	II	**Approaches to clean ganges**	5	48	3	1	0	10	10	20	80	100	4
3	III	**Monitoring of the river ganges & its health**	5	48	3	1	0	10	10	20	80	100	4
PROJECT/FIELD WORK													
4	**Project/Field Work**			144	0	0	12				100	100	6
Total					**9**	**3**	**12**	**30**	**30**	**60**	**340**	**400**	**18**

L *– Lecture;* ***T*** *– Tutorial;* ***P*** *– Prject/Field Work;* ***CT*** *- Cumulative Test*
TA *- Teacher's Assessment;* ***ESE*** *- End Semester Exam.*

Paper Setting pattern for End Semester Examination

1. Question paper consists of eleven questions in all. All questions are divided into Three Sections-A, B & C

2. Section A is compulsory of objective/ Short Answer/Fill in the blanks types of Questions from all five Units. Total Marks: 20

3. Section B has Six questions from units I, II, & III (Two Questions from each Units). Each question may be divided into more than one part. Attempt any three from this section. Total Marks: 36 (12 marks each).

4. Section C has four questions from units IV & V (Two Questions from each Units). Each question may be divided into more than one part. Attempt any two from this section. Total Marks: 24 (12 marks each question).

5. The theory examination paper shall be of 03 hours containing 80 marks.

(Semester-I)
Shri Ganga-Rakshak/Ganga-Sewak

Paper-I

(Spiritual, Cultural and Modern concept of the Ganga)

Unit I. The Spiritual, cultural, modern belief and significance of the holy Ganga.

Unit II. The philosophy of holy Ganga; not a river but is a belief and Life Line of Indians.

Unit III. Journey of the Ganga

Gomukh to Haridwar	(Upper stretch)
Haridwar to Varanasi	(Middle stretch)
Varanasi to Ganga Sagar	(Lower stretch)

Unit IV. Civilization at Gangatic valley
Industrialization at Gangatic valley

Unit V. The early Ganga and manmade endangered Ganga

Text & Reference Books:

1. *Rakshat Gangam- by Dr. Kamla Pandey (Sheemata Publishers, Varanasi)*
2. *The Ganges in Myth and History by by Steven G. Darian (Motilal Banarsidass Publishers)*
3. *The Birth of the Ganga by Harish Johari (published by sanatan society)*
4. *Ganga: A Journey Down the Ganges River by Julian Crandall Hollick (published by Island Press)*
5. *Our National River Ganga by Editors: Sanghi, Rashmi (Ed.) (published by Springer, London))*

Paper-II: Socio-Economic and Cultural Aspects of the Ganga

Unit I. Socio-economic & religious status of the river basin.

Unit II. Ancient practices for river conservation.

Unit III. The criteria for sustainable use of water for irrigation, industries, municipalities & domestic purposes.

Unit IV. Impact assessment of the socio-cultural & religious events like Kumbh, Chhatha, Durgapuja, Ganapati festival, etc.

Unit V. Scientific study and analysis of traditional knowledge & practices.

PAPER III: ECOLOGY, BIODIVERSITY AND POLLUTION

Unit 1: Ecology of the river Ganga

Definition and Concept of Ecology

Ecological factors: Abiotic, Biotic components and their role

River zonation, Habitat type, Food chain, food web, water cycle, nitrogen cycle

Unit 2: Floral diversity

Land diversity; Forest and its impact, Riparian vegetation

In water diversity: Bacteria, Algae, Fungi and other large plants

Unit 3: Faunal diversity

Wildlife diversity in the Ganga vicinity

In water diversity: Higher Invertebrates (Platyhelminthes to Mollusca)

Chordates; Fish, Amphibians, reptile, aves and mammals

Unit 4: Pollution

Definition, sources and types

Type of Pollutants; Organic and inorganic, Biodegradable and non-biodegradable

Haevy metals

Unit 5: Threats on the Ganga River

Water Pollution: tannery, Factory discharge, Cremation, Agriculture fertilizer,

Pilgrimage activity, Deforestation, Urbanization,

Hydroelectric Project, Dams, Barrage, Water Canal (Upper, middle and lower)

Text & Reference Books:

1. *The Birth of the Ganga by Harish Johari (published by sanatan society)*
2. *Ganga: A Journey Down the Ganges River by Julian Crandall Hollick (published by Island Press)*
3. *Our National River Ganga by Editors: Sanghi, Rashmi (Ed.) (published by Springer, London))*
4. *Fundamental of Ecology by E.P. Odum, Oxford Publication*
5. *Ecology and Environmental Sciences by P.D. Shrama*

(Sem-II)

Shri Ganga-Sewak

PAPER I: REJUVENATION OF THE RIVER GANGA

Unit I Religious and Cultural

Religious through Vedas, Ramayana and cultural through literature, audio-visual and other extension medium, arrangement of religious parve (Kumbh, religious bathing, Chhath) and other activities.

Unit II Ecological aspects

Habitat and substratum restoration, community (Plants and animal), water quality maintenance and discharge maintenance, other ecological challenges**,** a forestation, plantations etc.

Unit III Socio-economical

Socio-economic; development of temples, shops, ashram, electric cremation houses, fisheries and others

Unit IV

Strategies to reduce the developmental activities like Hydroelectric projects, barrage and rain and encourage for water harvesting and ground water recharging

Unit V

Public participation for awareness, training and other logistic support and education to society

Text & Reference Books:

PAPER V: APPROACHES TO CLEAN GANGES

Unit I. Spiritual and cultural approach

Cleaning of the river Ganges through spiritual methods

Unit II Traditional approach

Avoid the open defecation, avoid use of soap and other detergents, avoid throwing of dead bodies of animals etc.

Unit III Scientific approach

Production and conservation of Bacteriophases, recycling of organic materials through faunal communities, River Zonation, identification of keystone species in each zone, , maintenance of Flow (Discharge),Environmental Flow, River Linking

Unit IV Technological approach

Biotechnological, biochemical and Microbiological approach to restore clean and green Ganga. Recycling of waste materials through various technologies, Water management, Sewage treatment plants, Nano-technologies

Unit V: Legal Approach

Implementation of various rules and regulations for the cleaning of the river Ganges,

Text & Reference Books:

PAPER-VI: MONITORING OF THE RIVER GANGES & ITS HEALTH

Unit I. Physical parameters

Habitat Loss, Discharge of river, Flow of water, substrate degradation, Erosion of banks, Sedimentation, Landuse type

Unit II. Chemical parameters

Seasonal and annual variability in water quality, identification of pollution related sources, Deposition of heavy metals on river bed sediments and their sources.

Unit III Biological parameters

Collection, generation, computation and analysis of biological data, biomonitoring, population growth and alien species.

Unit III.

River Health assesement by using softwares. The degradation of river condition and components

Unit V

Green Chemistry, Eco-friendly technologies and working models for future projections to manage natural water resources and wastewater.

Text & Reference Books:

Project/Field Work
(Sem-I & II)

- To develop long-term & short-term action plans to increase water consumption efficiency, enhanced conservation, reduced drought exposure, and ecological restoration.

- To evolve water policy at the university level to minimize the water consumption, recycling of wastewater, check the water loss, encourage the rain water harvesting & groundwater recharging and manage water balance. This shall be extended as a model for publication program.

- To study the dynamics of the Ganga & Jamuna at Allahabad and develop appropriate action plan to make a role model for the river rejuvenation.

- To make general survey of the Allahabad city pertaining to the pollution sources, assess quality & quantity of the wastewater to suggest establishment of community treatment plant in different zones.

- To assess the impact of the discharge of wastewater, dead body cremation & solid waste disposal on the physico-chemical & bacteriological properties of the Ganga water & deposition of heavy metals on river bed sediments.

- To study the socio-cultural-economic & religious activities of the Ganga basin and develop strategies for its restoration.

- To develop need based courses and conduct multidisciplinary training, teaching, doctoral & post-doctoral programs related to river rejuvenation and water conservation.

- To develop strategies for water storage, water purification technologies & changed agricultural practices, etc. for economic & safe water consumption.

- To suggest strategies for the Ganga, river rejuvenation and conservation of water resources based on environmental legislation.

- To study the impact of climate change on structural & functional behavior of the Ganga river basin.

- To develop eco-friendly technologies and working models for future projections to manage natural water resources and wastewater.

- To activate women power for disseminating the socio-cultural, economic, religious, scientific & technological knowledge for appropriate conservation of rivers.

- Mass awareness programs based on research findings & reliable ecological data.