TERI School of Advanced Studies
Coca- Cola Department of Regional Water Studies

<u>Minutes of the Board of Studies Meeting</u>

Date: 01 July 2020
Time: 10:00-12:00 Noon

A meeting of the Board of Studies (BoS) of the Coca Cola Department of Regional Water Studies was held online, through Microsoft Teams on 01/07/2020 during 10:00-12:00 Noon.

External Members –
1. Prof. R. B. Singh (Delhi University)
2. Prof Rakesh Mehrotra (DTU)

Internal Members present –
1. Prof. Arun Kansal (HoD)
2. Dr Fawzia Tarannum
3. Ms Ranjana Ray Chaudhuri
4. Dr Sherly M A

Summary of Approvals

1) BoS approved the minor and major project course outlines for M.Sc and M.Tech programmes given in Annexure 1 to 4.
2) BoS approved the second semester field trip course outline given in Annexure 5.
3) BoS approved the department specific Ph. D. programme outline given in Annexure 6.
4) BoS approved the removal of one credit assigned to the field trip in Semester 1.
5) BoS approved the inclusion of discipline-specific B.VoC programmes in the eligibility criteria for admission in MSc programme of the Department.
6) BoS granted automatic approval of changes in the contents and assigned credits of courses, whenever done in future, that are adopted from other programmes of TERI SAS.

Meeting minutes

The Head of the Department welcomed the Board of Studies (BoS) members and gave them a brief introduction about the department and the agenda items for the meeting as follows:

1. **Review and approval of course outlines for minor and major projects.**
2. **Review and approval of course outline for the 'Field trip on water management practices' in the second semester.**
3. **Review and approval of the Ph.D. programme in Water Science and Governance**
4. **Removal of one credit assigned for field trip in first semester of all programs offered by the Department.**
5. **Review and approval of including some discipline specific B.VoC programme in the eligibility criteria for admission in MSc programme of the Department.**
6. **Automatic approval of changes in the contents and assigned credits of courses adopted from other programmes of TERI SAS.**

The agenda for the meeting and a background note were also shared with the BoS members in advance.

The mandate laid down by the IQAC committee to come up with the course outlines for all courses that had credits assigned to them was explained to the BoS members by the programme coordinator Dr. Fawzia. She also briefed them about the requirement to develop the department specific PhD programme. Each agenda item was presented before the BoS members by Dr. Fawzia.

1. **Review and approval of course outlines for minor and major project**

The Department offers two programmes- M.Sc. (Water Science and Governance) and M.Tech. (Water Resources Engineering and Management). Both programmes have a 6-credit project work (minor project) in the third semester and a 16-credit project work (major project) in the fourth semester, which were already approved by the Board of Studies (BoS) and Academic Council (AC). So far, there were written guidelines for the project work and the students were appraised about learning objectives, learning outcomes, evaluation criteria and project conduct guidelines during the orientation programme in the beginning of the semester. The monitoring, evaluation and submission were done online on University portal- a practice followed by all programmes of the University.

The BoS was informed that conventionally the taught courses are reviewed by two subject experts before presenting. However, these courses do not fall under any specific expertise domain. They are being run in the university for many years; hence Master's Programme

Evaluation Committee (MPEC) of the Department has reviewed the outlines prepared by the project coordinator. The BoS was requested to allow the presentation of the course outlines and exempt them from external review.

The BoS proposed the following suggestions:

a) **Specific changes to the outlines:**
   - Prof. Singh suggested that students should be made aware of the various government programmes in water through the project courses, and recommended to align the project topics accordingly. The suggestions have been incorporated in the objectives and the learning outcomes of all the project course outlines.

b) **Suggestions for topics and thematic areas for projects:**
   - Prof. Singh suggested on working towards Water Health Card similar to the Soil Health Card being followed by the government. He also suggested that the projects should focus on water science-policy interface and work towards bringing out issues that contribute towards new water policy that needs urgent revision. In a similar line, he stressed upon the role of integrated management of floods and droughts as well as integrated management of land and water using real time and near real time data. He recommended that water related institutions and the role of panchayats and local urban bodies in governance should also be included.
   - Prof. Mehrotra emphasized the need to look beyond technical and focus on water governance at all levels. He also referred to the theory-based (basic) research studies to be included in project courses for which Prof. Kansal responded that selective studies have been conducted/ are ongoing based on the infrastructure and laboratory resources availability in the University. Prof. Mehrotra also pointed out that national-level guideline for water reuse is critical in sustainable water resources management.

The course outlines after incorporating BoS suggestions are presented at
   - Annexure 1. Course title: - Minor Project in Water Resources Engineering and Management (6 credit course offered in 3rd semester of M.Tech. Programme)
   - Annexure 2. Course title: - Major Project in Water Resources Engineering and Management (16 credit course offered in 4th semester of M.Tech. Programme)
   - Annexure 3. Course title: - Minor Project in Water Science and Governance (6 credit course offered in 3rd semester of M.Sc. Programme)
   - Annexure 4. Course title: - Major Project in Water Science and Governance (16 credit course offered in 4th semester of M.Sc. Programme)

With the above changes, the BoS approved the revised course outlines of minor/major project for M.Tech and M.Sc programmes, which are presented in the Annexure 1 to 4 of the minutes.

2.   Review and approval of course outline for 'Field trip on water management practices' in second semester.

Dr Fawzia informed the BoS on the conduct and evaluation of the 'Field trip 2' in the past which had one credit assigned to it and was conducted in the second semester for M.Sc and M.Tech programme. The name change of the course to *Field trip on water management practices* and the course outline were presented to the BoS.

The BoS proposed the following suggestions:

- Prof. Singh suggested that one or two case studies for best practices in water management would enhance quality of the course. For this, Prof. Kansal suggested for a report on the sites/plants visited so that the best practices can be recorded.

- Prof. Singh also suggested that we should encourage students to take up comparable case studies from foreign countries too for which Dr Fawzia mentioned that case study based teaching is being practiced in the department.

With the above changes, the BoS approved the new course outline of the Field trip which is presented in the Annexure 5 of the minutes.

3.   Review and approval of the Ph.D. programme in Water Science and Governance
Dr. Fawzia shared the background to the Ph.D. programme being run by the university since its inception and each Department/Centers following a university wide common guideline. The department specific programme guideline and the proposed nomenclature for the programme were presented by her to the BoS for approval. The BoS was informed that every Ph.D. programme would still adhere to the Ph.D. regulation and guidelines of the university.

The BoS gave the following suggestions:

- The BoS members suggested the following two broad themes for the Ph.D. programme being offered by the department:
  - ➢ Water Science, Governance and Sustainability
  - ➢ Water Resources Engineering and Management
- Prof. Singh suggested that in Research Methodology, equal emphasis should be given on qualitative and quantitative techniques.

With the above changes, the BoS approved the revised Ph.D. programme outline which is presented in the Annexure 6 of the minutes.

4.   Removal of one credit assigned for field trip in first semester of all programmes offered by the Department.

The BoS was informed that removal of credit was already approved in the BoS meeting held in 2019, but we missed to present it in the AC meeting. Approval is sought again from the BoS to enable us to present it in the forthcoming AC meeting.

The BoS members approved the removal of credit.

5.   Review and approval of inclusion of select discipline specific B.VoC programmes in the eligibility criteria for admission in M.Sc programme of the Department.

The inclusion of B.Voc programme in the following disciplines as the eligibility criteria for the M.Sc. (Water Science and Governance) programme, which was discussed in the MPEC (Masters Programme Evaluation Committee) meeting was presented before the BoS.
•   Industrial Waste Management
•   Soil and Water Conservation
•   Industrial Chemistry
•   Industrial Waste Treatment Technology
•   Sustainable Agriculture

The UGC letter D.O.No.F.2-7 l20r 4(CC/NVEQF)/Misc. dated 04 Aug 2016 recognizing B.Voc. at par with other Bachelor Degrees and para (ii) stating the 'Students with B.Voc. Degree should be considered eligible for the trans-disciplinary vertical mobility into such courses where entry qualification is a Bachelor Degree without specific requirement in a particular discipline' (Annexure 7) and the Gazette of India Notification 'The Gazette of India, July 5, 2014, (Asadha 14, 1936), Part III-Section 4, Page 2990, S.No. 55 on the eligibility criteria of M.Sc programmes. The notification says that the entry criteria for M.Sc. Program is Bachelor's degree. (Relevant sections in Annexure 8) were presented before the BoS.

The BoS members deliberated on the above programs in its entirety and having found a strong alignment of the course outline with the M.Sc (Water Science and Governance) programme with these approved it for inclusion as the eligibility criteria for the M.Sc. (Water Science and Governance) Programme.

The BoS members approved the inclusion of discipline-specific B.VoC programmes in the eligibility criteria for admission in MSc programme of the Department.

6.   Automatic approval of changes in the contents and assigned credits of courses adopted from other programmes of TERI SAS.

The BoS was informed that the course outline of NRE 111 -Environmental Statistics, offered by the Department of Energy and Environment (DEE) in their M.Sc. programmes is presently a 3-credit course and is also offered in M.Sc. (Water Science and Governance) programme. The course content is being revised making it equivalent to a 4-credit course. The course outline was shared by DEE and will be presented in the forthcoming AC for approval. BoS was requested to grant automatic approval of changes in such courses that are adopted from other department.

The BoS members granted an automatic approval of changes, whenever made in future, in the contents and assigned credits of the courses that are adopted from other programmes of TERI SAS.

M.Tech. Water Resources Engineering and Management

Course title: Minor Project in Water Resources Engineering and Management				
Course code: WSW xxx	**No. of credits:** 6	**L-T-P:** 0-0-168	**Learning hours:** 200*	
Pre-requisite course code and title (if any): NA				
Department: Coca-Cola Department of Regional Water Studies				
Course Coordinator: Project/ Placement coordinator		**Course Instructor:** Assigned supervisor(s)		
Contact details: email of assigned supervisors				
Course type: Core		**Course offered in:** Semester 3		

Course description

The course offers thorough problem-based learning approach, guided by realistic and challenging industry/field-level/ literature review requirements – surface and ground water assessment and management, water and waste water treatment and management, water modeling and prediction (quality & quantity), hazard, vulnerability & risk mapping of floods and droughts, water-related disaster management and so on. The course includes a 6-8 weeks of research and/or application-oriented problem solving to challenges in water resources management through supervised self-learning approach. The student shall apply her/his classroom learning for identification of problem, execute analysis based on available literature, data collected and reports and present the outputs.

Course objectives

- To work on ideas that are aligned with the government programmes on water management.
- To provide hands-on exposure to the student on the real time problems in water resources management that includes scientific, technological, socioeconomic, policy making and/or governance aspects.
- To enable a student to work on short-term projects and come up with the solutions commensurate with the assigned problem.
- To impart skills in preparing detailed report and describing the project and results/findings.

Course contents

Module	Topic	L	T	P
1	- Problem identification on thematic area in consultation with the host industry/organization/internal supervisors - Define objectives and relevant tasks to be performed - Define a broad methodology to be followed and identify the materials/modeling tools to be used for achieving each objective.	0	0	40
2	- Primary and/or secondary data collection or other relevant work depending on the objectives - Systematic review of literature, internal or external reports etc. relevant on the specific problem and create benchmark - Develop methodology/framework to be followed and identify materials/modeling tools to be used for achieving each objective - Perform laboratory experiments and/or modeling (statistical, numerical and/or geospatial) - Develop overall conclusion based on inferences and findings and enlisting the limitations of the work. - Preparing draft thesis with the results and findings from the study.	0	0	128
	Total	**0**	**0**	**168**
* The remaining learning hours are allocated for self-learning, interaction with expert, training at the organization, report writing etc.				

Evaluation criteria

- Response/feedback from the host organization/supervisor (20%)
- Minor project report (40%)
- Presentation and Viva (30%)
- Meeting timeline (10%) (Consisting of: joining report (2%), progress reports (2% each), feedback form (2%), and final thesis (2%).

- If plagiarism is detected using plagiarism checking software (e.g. Turnitin), it will be referred to the Minor Project Committee (comprising of supervisors and faculty members), which would take a decision and penalty to be imposed/disciplinary action to be taken. The guidelines for the Minor Project Committee are as follows:

Levels of Plagiarism	Percentage of similarity	Maximum percentage marks to be deducted from dissertation/thesis
Level 3	> 60%	Student's registration to the program stands cancelled
Level 2	> 40% ≤ 60%	Student repeats the course next year
Level 1	> 10% ≤ 40%	The student is required to resubmit the report within a week
Level 0	≤ 10%	0%

- The students scoring less than or equal to 50% (or $\leq 50\%$) overall marks in the evaluation would be considered to have failed in this course. Grading of the Minor Project will be absolute in nature and would be done as per the following criteria:

>90	A+
>80≤90	A
>70≤80	B+
>60≤70	B
>50≤60	C+
>45≤50	C
>40≤45	D
≤40	F

Learning outcomes

- Student develops an understanding of real time problems/challenges in water resources management projects and their alignment with the government programmes.
- Student is exposed to a short-term project through field level and/or secondary data collection, methodology formulation and analysis.
- Student learns and applies relevant scientific methods and modeling techniques (statistical, numerical and/or geospatial) in problem-solving.
- Student is trained to effectively communicate and demonstrate the learning through structured thesis/dissertation and oral presentation.

Pedagogical approach

Self-learning; discussion with supervisors; interaction with experts;

Materials

Literature and reports related to the specific problem.

Additional information (if any)

A detailed guideline along with important dates and format will be notified by the department, in advance, with other relevant details.
If there is any change in evaluation criteria/policy, it will be updated in the guideline every year.
Report submission and schedule of presentation will be coordinated by Project/Programme coordinators.

Student responsibilities

Attendance; Discipline; Research Ethics etc.

Course Reviewer: MPEC

Course title: Major Project in Water Resources Engineering and Management			
Course code: WSW xxx	**No. of credits:** 16	**L-T-P:** 0-0-448	**Learning hours: 640***
Pre-requisite course code and title (if any): NA			
Department: Coca-Cola Department of Regional Water Studies			
Course Coordinator: Project/ Placement coordinator		**Course Instructor:** Assigned supervisor(s)	
Contact details: email of assigned supervisors			
Course type: Core		**Course offered in:** Semester 4	

Course description

The course offers a research driven learning approach, guided by realistic and challenging water issues of the industry or in the field – surface and ground water assessment and management, water and waste water treatment and management, water modeling and prediction (quality & quantity), hazard, vulnerability and risk mapping of floods and droughts, water-related disaster management and so on. The course includes a 16-20 weeks of research/ on-job training on a live project or a case study through supervised self-learning approach. Based on the need of the project or case study, the student shall conduct a thorough background study and literature review to formulate the problem statement. This shall be supported by primary and/or secondary data collection on various aspects - scientific, technological, socioeconomic, policy and regulations. The student shall form a set of objectives to address the problem statement followed by proposing a methodology/framework to achieve the set of objectives. The methodology shall include a combination of tasks: Analysis of data, performing water modeling (statistical, numerical and or geospatial), development of policy/design recommendations and/or similar tasks assigned by the host organizations. Finally, the student shall submit a thesis report with the results/findings.

Course objectives

- To work on ideas that are aligned with the government programmes on water management.
- To provide hands-on learning to the students on the real time problems in water discipline that includes scientific, technological, socioeconomic, policy making and/or governance aspects.
- To enable the student to work on live projects and come up with the solutions commensurate with the assigned problem.
- To impart skills in preparing a detailed report describing the project and the results/findings.
- To develop job-oriented specialization relevant for transitioning from academic milieu to a work environment.

Course contents

Module	Topic	L	T	P
1	- Broad problem identification on thematic area in consultation with the host industry/organization/internal and external supervisors. - Define overall aims and objective and relevant research questions and research objectives to be addressed.	0	0	40
2	- Primary and/or secondary data collection or other relevant work depending on the objectives. - Systematic review of literature, internal or external reports etc. relevant on the specific problem and create benchmark. - Define methodology to be followed and identify materials/modeling tools to be used for achieving each objective.	0	0	40
3	- Perform laboratory experiments, survey and/or modeling (statistical, numerical and/or geospatial). - Analysis and interpretation of the findings/results/data.	0	0	368

		• Develop an overall conclusion based on inferences and findings and enlist the limitations of the work. • Preparing a draft thesis with the results and findings from the study.			
	Total		**0**	**0**	**448**

* The remaining learning hours are allocated for self-learning, interaction with expert, training at the organization, dissertation writing etc.

Evaluation criteria

- Dissertation (40%)
- Presentation and viva (30%)
- Timeline adherence (10%)   [Consisting of: joining report (1%), synopsis and topic (1%), progress report (0.5% each), feedback form (1%), final dissertation (5%)]
- Feedback from the Host Organization/Supervisor (20%)
- If plagiarism is detected using plagiarism checking software (e.g. Turnitin), it will be referred to the Major Project Committee (comprising of supervisors and faculty members), which would take a decision and penalty to be imposed/disciplinary action to be taken. The guidelines for the Major Project Committee are as follows:

Levels of Plagiarism	Percentage of similarity	Maximum percentage marks to be deducted from dissertation/thesis
Level 3	> 60%	Student's registration to the program stands cancelled
Level 2	> 40% ≤ 60%	Student repeats the course next year
Level 1	> 10% ≤ 40%	The student is required to resubmit the report within a week
Level 0	≤ 10%	0%

• The students scoring less than or equal to 50% (or ≤ 50%) overall marks in the evaluation would be considered to have failed in this course. Grading of the Major Project will be absolute in nature and would be done as per the following criteria:

>90	A+
>80≤90	A
>70≤80	B+
>60≤70	B
>50≤60	C+
>45≤50	C
>40≤45	D
≤40	F

Learning outcomes

- Student develops an understanding of real time problems/challenges in water resources management projects and their alignment with the government programmes.
- Student is exposed to live projects through field level and/or secondary data collection, methodology formulation and analysis.
- Student learns and applies relevant scientific methods and modeling techniques (statistical, numerical and/or geospatial) in problem-solving.
- Student is trained to effectively communicate and demonstrate the learning through structured thesis/dissertation and oral presentation.

Pedagogical approach

Self-learning; discussion with the supervisors; interaction with experts; field work; laboratory work, etc.

Materials

Peer-reviewed journal articles

Reputed conference proceedings Reports related to the specific project Learning materials provided by the host organization
Additional information (if any) A detailed guideline along with important dates and format will be notified by the department, in advance, with other relevant details. If there is any change in evaluation criteria/policy, it will be updated in the guideline every year. Dissertation submission and schedule of presentation will be coordinated by Project/Programme coordinators.
Student responsibilities Attendance; Discipline; Research Ethics etc.

Course Reviewer: MPEC

M.Sc. Water Science and Governance

Course title: Minor Project in Water Science and Governance			
Course code: WSW xxx	**No. of credits:** 6	**L-T-P:** 0-0-168	**Learning hours: 200***
Pre-requisite course code and title (if any): NA			
Department: Coca-Cola Department of Regional Water Studies			
Course Coordinator: Project/ Placement coordinator	**Course Instructor:** Assigned supervisor(s)		
Contact details: email of assigned supervisors			
Course type: Core	**Course offered in:** Semester 3		

Course description

The course offers a research driven learning approach, guided by realistic and challenging problems in water sector. The course includes 6-8 weeks of in-house research or industry training on any water-relevant problem through supervised self-learning approach. Based on need of contemporary areas of water sector, including groundwater management, wetlands, wastewater and sewage treatment, innovations in agriculture, water reuse, water efficiency, water audit & management, watershed practices and policy, guidelines & regulations, the students shall work on specific thematic areas, analyze data using basic statistics, assessing potential of improvement in existing solutions or similar tasks assigned by the supervisor. The students shall implement their classroom learnings and specialization, test hypothesis through literature review, experiment or field survey, analyze and report the results/findings. It would prepare students to take up water resource management projects in future with a clear understanding of linkage of water to sustainable development.

Course objective

- To work on ideas that are aligned with the government programmes on water management.
- To train students to use analytical skills and knowledge for addressing problems/challenges in contemporary areas of water sector including groundwater, water pollution, wastewater and sewage treatment, innovations in agriculture, water reuse, water efficiency, water audit & management, watershed practices and policy, guidelines & regulations
- To impart skills and training relevant to the specific fields as mentioned above.
- To enable the students to take up independent research work in future, applying various tools

Course contents

Module	Topic	L	T	P
1	• Broad problem identification on thematic area in consultation with the internal supervisor/host organization • Define overall aims and objective and relevant research questions and research objectives to be addressed	0	0	20
2	• Define methodology to be followed and identify materials/tools to be used for achieving each objective • Systematic review of literature, internal or external reports etc. relevant on the specific problem and create benchmark	0	0	20
3	• Identifying parameters, variables to carry out situation analysis or scenario analysis depending on objectives • Data collection/ field survey/experimental or other relevant work depending on the objectives • Analysis and interpretation of the findings/results/data	0	0	128

	• Developing overall conclusion based on inferences and findings and enlisting the limitations of the work.			
	Total	**0**	**0**	**168**

* The remaining learning hours are allocated for self-learning, interaction with expert, training at the organization, dissertation writing etc.

Evaluation criteria

- Response/feedback from the host organization/supervisor (20%)
- Minor project report (40%)
- Presentation and Viva (30%)
- Meeting timeline (10%) (Consisting of: joining report (2%), progress reports (2% each), feedback form (2%), and final thesis (2%).

- If plagiarism is detected using plagiarism checking software (e.g. Turnitin), it will be referred to the Minor Project Committee (comprising of supervisors and faculty members), which would take a decision and penalty to be imposed/disciplinary action to be taken. The guidelines for the Minor Project Committee are as follows:

Levels of Plagiarism	Percentage of similarity	Maximum percentage marks to be deducted from dissertation/thesis
Level 3	> 60%	Student's registration to the program stands cancelled
Level 2	> 40% ≤ 60%	Student repeats the course next year
Level 1	> 10% ≤ 40%	The student is required to resubmit the report within a week
Level 0	≤ 10%	0%

• The students scoring less than or equal to 50% (or ≤ 50%) overall marks in the evaluation would be considered to have failed in this course. Grading of the Minor Project will be absolute in nature and would be done as per the following criteria:

>90	A+
>80≤90	A
>70≤80	B+
>60≤70	B
>50≤60	C+
>45≤50	C
>40≤45	D
≤40	F

Learning outcomes

- Student develops an understanding of real time problems/challenges in water resources governance and management projects and their alignment with the government programmes.
- Student learns to apply research methods and different statistical tools in real-time research projects.
- Student learns and applies relevant scientific methods and techniques (statistical, numerical and/or geospatial) in problem-solving.
- Student is trained to effectively communicate and demonstrate the learning through structured thesis/dissertation and oral presentation.

Pedagogical approach

Self-learning; discussion with the supervisors; interaction with experts; field work; laboratory work, etc.

Materials
Peer-reviewed journal articles
Reputed conference proceedings
Reports related to the specific project
Learning materials provided by the host organization
Additional information (if any)
A detailed guideline along with important dates and format will be notified by the department, in advance, with other relevant details.
If there is any change in evaluation criteria/policy, it will be updated in the guideline every year.
Dissertation submission and schedule of presentation will be coordinated by Project/Programme coordinators.
Student responsibilities
Attendance; Discipline; Research Ethics etc.

Course Reviewer: MPEC

Course title: Major Project in Water Science and Governance			
Course code: <mark>WSW xxx</mark>	**No. of credits:** 16	**L-T-P:** 0-0-448	**Learning hours: 640***
Pre-requisite course code and title (if any): NA			
Department: Coca-Cola Department of Regional Water Studies			
Course Coordinator: Project/ Placement coordinator		**Course Instructor:** Assigned supervisor(s)	
Contact details: email of assigned supervisors			
Course type: Core		**Course offered in:** Semester 4	

Course description

The course offers a research driven learning approach, guided by realistic and challenging problems in water sector. The course includes 16-20 weeks of industry training/consultancy/in house research on any water-relevant problem through supervised self-learning approach. Based on need of contemporary areas of water sector in detail, including groundwater management, water pollution, wetlands, wastewater and sewage treatment, innovations in agriculture, water reuse, water efficiency, water audit & management, watershed practices, river basin management and policy, guidelines & regulations, the students shall work on specific thematic areas, analyze data using basic statistics, assessing potential of improvement in existing solutions or similar tasks assigned by the supervisor. The students shall implement their classroom learnings and specialization, test hypothesis through literature review, experiments, or field survey, analyze and report the results/findings. It would prepare students to take up water resource management projects in future with a clear understanding of linkage of water to sustainable development.

Course objective

- To work on ideas that are aligned with the government programmes on water management.
- To train students to use analytical skills and knowledge for addressing problems/challenges in contemporary areas of water sector including wastewater and sewage treatment, innovations in agriculture, water reuse, water efficiency, water audit & management and policy, guidelines & regulations
- To impart skills and training relevant to the specific fields as mentioned above.
- To enable the students to execute research work including designing research strategies and methodology depending on the problem and demonstrate findings thoroughly.
- To develop job-oriented specialization significant for transitioning from academic milieu to a work environment.

Course contents

Module	Topic	L	T	P
1	- Broad problem identification on thematic area in consultation with the host industry/organization - Define overall aims and objective and relevant research questions and research objectives to be addressed	0	0	40
2	- Define methodology to be followed and identify materials/tools to be used for achieving each objective - Systematic review of literature, internal or external reports etc. relevant on the specific problem and create benchmark	0	0	40
3	- Identifying parameters, variables (including identification of new variables) to carry out situation analysis or scenario analysis depending on objectives - Data collection/ modelling/field survey/experimental or other relevant work depending on the objectives - Analysis and interpretation of the findings/results/data	0	0	368

	• Developing overall conclusion based on inferences and findings and enlisting the limitations of the work.			
	Total	**0**	**0**	**448**

* The remaining learning hours are allocated for self-learning, interaction with expert, training at the organization, dissertation writing etc.

Evaluation criteria

- Dissertation (40%)
- Presentation and viva (30%)
- Timeline adherence (10%) [Consisting of: joining report (1%), synopsis and topic (1%), progress report (0.5% each), feedback form (1%), final dissertation (5%)]
- Feedback from the Host Organization/Supervisor (20%)
- If plagiarism is detected using plagiarism checking software (e.g. Turnitin), it will be referred to the Major Project Committee (comprising of supervisors and faculty members), which would take a decision and penalty to be imposed/disciplinary action to be taken. The guidelines for the Major Project Committee are as follows:

Levels of Plagiarism	Percentage of similarity	Maximum percentage marks to be deducted from dissertation/thesis
Level 3	> 60%	Student's registration to the program stands cancelled
Level 2	> 40% ≤ 60%	Student repeats the course next year
Level 1	> 10% ≤ 40%	The student is required to resubmit the report within a week
Level 0	≤ 10%	0%

• The students scoring less than or equal to 50% (or ≤ 50%) overall marks in the evaluation would be considered to have failed in this course. Grading of the Major Project will be absolute in nature and would be done as per the following criteria:

>90	A+
>80≤90	A
>70≤80	B+
>60≤70	B
>50≤60	C+
>45≤50	C
>40≤45	D
≤40	F

Learning outcomes

- Student develops an understanding of real time problems/challenges in water resources governance and management projects and their alignment with the government programmes.
- Student learns to apply research methods and different statistical tools in real-time research projects.
- Student learns and applies relevant scientific methods and techniques (statistical, numerical and/or geospatial) in problem-solving.
- Student is trained to effectively communicate and demonstrate the learning through structured thesis/dissertation and oral presentation.

Pedagogical approach

Self-learning; discussion with the supervisors; interaction with experts; field work; laboratory work, etc.

Materials

Peer-reviewed journal articles
Reputed conference proceedings
Reports related to the specific project

Learning materials provided by the host organization
Additional information (if any)   A detailed guideline along with important dates and format will be notified by the department, in advance, with other relevant details.   If there is any change in evaluation criteria/policy, it will be updated in the guideline every year.   Dissertation submission and schedule of presentation will be coordinated by Project/Programme coordinators.
Student responsibilities   Attendance; Discipline; Research Ethics etc.

Course Reviewer: MPEC

Course title: Field trip on water management practices				
Course code: WSW 105	**No. of credits:** 1	**L-T-P:** 2-2-20		**Learning hours:** 14
Pre-requisite course code and title (if any): NA				
Department: Coca-Cola Department of Regional Water Studies				
Course coordinator: Dr. Fawzia Tarannum				
Contact details: fawzia.tarannum1@terisas.ac.in				
Course type: Core		**Course offered in:** Semester 2		

Course description

The course is designed to provide the students an exposure to selected live examples of water resources conservation techniques and management through field/organization visits. The course includes visiting operational water and wastewater treatment plants, successful sustainable water conservation practices in both rural and urban contexts, attending expert lectures, and visiting state of the art technologies in water and disaster management.

Course objectives

- To provide exposure to the design, infrastructure and conservation capacities of water and wastewater management projects.
- To help the students develop a thorough understanding of the various field level factors to be considered in implementing a successful project.
- To introduce the students to the latest developments in technology and governance relevant to water resources management.

Course contents

Module	Topic	L	T	P
1	**Introduction to various sites/organizations chosen (before visit)** - Briefing on the purpose of the site/organization visit, scope, and the expected outcomes from the visit. - Details of the presentation to be delivered by the students post-trip.	2	0	0
2	**Field visit and discussion (one or more of the items below)** a. Site visit - Hydro meteorological and geological characteristics of the site visited - Existing best practices in water conservation and management within the site - Socioeconomic status of the community - Status of existing technologies - Operation and maintenance of an existing project - Socio-environmental benefits b. Organization visit - Technological and governance capabilities relevant to water management and disaster mitigation - Demo of technologies relevant to water discipline c. Water/Wastewater Treatment plant visit - Status of existing technology - Operation and maintenance of plant and monitoring - Performance of the plant from a sustainability perspective	0	0	14

3	**Analysis and reporting (after visit - a combination of two or more items below)** • Background study • Hydrological analysis of the site with maps using GIS • Performance evaluation of a treatment plant • Challenges and scope of improvement in existing technologies and practices • Application of computational technology in water management or disaster mitigation of the site visited • Socioeconomic analysis of the community within the context of water management	0	2	6
	Total		**2**	**2**	**20**

Evaluation criteria
- Presentation: 50%
- Report: 40%
- Interaction during visit: 10%

Learning outcomes

- Students understand the various factors to be considered in a water management project.
- Students learn to appreciate the state-of-the-art technologies in water and disaster management.
- Students get exposed to live projects through field level data collection, methodology formulation and analysis.
- Students are equipped to take up dynamic challenges in the field as water professionals.

Pedagogical approach

Class-room interactions; Field study; Group discussion

Materials

- Available project report or annual reports of the respective plants/projects/organizations
- Reports available with MoEFCC, CPCB, CGWB, CWC and other national and state level reports and policies

Additional information (if any)

Student responsibilities

Attendance; discipline; Q&A with the experts during field visit

Course Reviewer: MPEC

<u>**Ph.D. Programme outline**</u>

<u>**Coca Cola Department of Regional Water Studies**</u>

<u>**Themes:**</u>

- **Water Science, Governance and Sustainability**
- **Water Resources Engineering and Management**

Programme Overview

The Coca-Cola Department of Regional Water Studies at TERI School of Advanced Studies offers time Ph.D. programme (for both full time and part time candidates) in Water Science and Governance. Over the years, there has been a growing pressure on the water systems leading to severe competition among various competing uses of water. Rapid population growth and climate change has further added to water woes and conflicts at all levels.

There is a growing consensus among the stakeholders to adopt an interdisciplinary approach to sustainable water management. The change management however requires an in-depth understanding of complex water-related issues through basic as well as applied research to influence the decision maker and planners. The department offers an interdisciplinary PhD programme that covers scientific, technological, socioeconomic, policy and governance aspects of water research.

Operational aspects of each Ph.D. programme are governed and guided by the provisions laid down in the '***TERI School of Advanced Studies Ph.D. Regulations-2019***".

Programme USP

Ph.D. Programme of the department is aimed at creating new knowledge by enabling students to exploit their own intellectual potential through carefully conducted and meticulously supervised research. It promotes research that is impactful, and state of the art. Ph.D. Programme prepares students to play an active role in the international academia through their contributions in their chosen field of study.

Programme Outcomes

At the end of the Ph.D. programme, the students should be able to:

- Have an in-depth understanding of the nuances of the problem being researched and the literature surrounding it
- Explore frontiers of fundamental, applied, and interdisciplinary research as decided by the chosen field of study

- Understand and apply scientific methods, tools and techniques to carry out high quality research work

- Independently plan and execute original research with high ethical standards

- Develop suitable communication and interpersonal skills, critical thinking and problem-solving attitude as appropriate for a Ph.D. student

Programme Structure

PhD Programme is divided into three stages. These are as follows:

Stage I: Ph.D. Course work

The Ph.D. course work in the department is designed to develop rigorous research and analytical skills among the students. It is intended to equip them with the necessary research and analytical skill sets. The Ph.D. Course work is governed by the 'TERI School of Advanced Studies Ph.D. Regulations-2019' (and subsequent amendments) and UGC (Minimum Standards and Procedure for Award of M.Phil./Ph.D. Degrees) Regulations, 2016 (and subsequent amendments).

Ph.D. Course work structure and requirement

A minimum of 8 credits and a maximum of 16 credits will have to be completed by the Ph.D. students in order to complete their course work. Some courses are mandatory in nature and some are prescribed by the Department Research Committee (DRC)) on the recommendations of the Student Research Committee (SRC). The Ph.D. course work must be completed within the first two semesters of the joining of the programme.

Every Ph.D. student must complete the following mandatory courses (or their equivalent on the recommendation of SRC and approval of DRC).

a) Research Methodology – 3 Credit Course (Credit only course):
- NRE 173 Research methodology and thesis writing (2 credits)
- WSW 179 Qualitative research methods and technical writing (3 credits)
- Any other course recommended by TERI SAS on the topic.

b) Research and Publication Ethics - 2 Credit course (Credit or audit course)

c) Quantitative Research Method – minimum 2 Credit course from the below list of applicable quantitative methods courses:
- NRE 111 Environmental Statistics (4 credits) (AC approval awaited)
- MEU 173 Stochastic Modelling (4 credits)
- NRE 112 Multivariate Data Analysis (3 credits)
- BSI 175 Statistical Methods for Management (3 credits)
- MPE 172 Econometrics (4 credits)
- MPE 178 Time Series and Regression Analysis (4 credits)

- MPD 111 Quantitative Analysis for Development Practice (3 credits)
- NRC 142 Spatiotemporal Data Analysis (3 credits)
- NRG 163 Spatial data modelling and its applications (4 credits)
- Any other course recommended by TERI SAS on the topic.

Apart from the above, PhD students are encouraged to take 'Communication Skills and technical writing' as an audit/credit course. Also, Supervisor/SRC can suggest more courses over and above the mandatory courses. Students may also opt for courses related to the thematic areas of research based on the advice of respective SRCs and approved by DRCs.

Stage II: Research proposal defence and research work

- A student will be permitted to appear for defending the research proposal only after he/she has completed the Ph.D. course work as decided by the SRC.
- As a part of the research proposal defence, a draft research proposal must be prepared by the student in consultation with the Supervisor(s).
- The Supervisor will schedule the research proposal defence activity.
- After the satisfactory defence, the student will submit his/her final research proposal and related documents to the DRC with due approval from the Supervisor. The final research proposal must be submitted to the DRC within a period of 24 months from the date of registration in the Ph.D. programme.
- During Ph.D. programme, the student shall appear before the SRC at least once in each semester to make a presentation of the progress of his/her work. This process will continue until thesis submission

Stage III: Thesis submission:

Ph.D. scholars may submit his/her thesis at any time provided that s/he has completed the minimum period of registration and s/he has completed the course work requirement as prescribed by the DRC on the recommendations of the SRC with a requisite CGPA and has also successfully defended his/her research proposal. Prior to the synopsis submission, the scholar shall make a presentation in the Department before the SRC and DRC.

विश्वविद्यालय अनुदान आयोग
University Grants Commission
(मानव संसाधन विकास मंत्रालय, भारत सरकार)
(Ministry of Human Resource Development, Govt. of India)

बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
Bahadur Shah Zafar Marg, New Delhi-110002

Ph.: 011-23239337, 23236288,
Fax : 011-23238858, email : jssandhu.ugc@nic.in

प्रो. (डॉ.) जसपाल एस. सण्धू
सचिव
Prof. Dr. Jaspal S. Sandhu
MBBS, MS (Ortho), DSM, FAIS, FAISM, FAFSM, FFIMS, FAMS
Secretary

D.O.No.F.2-7/2014(CC/NVEQF)/Misc.   3rd August, 2016
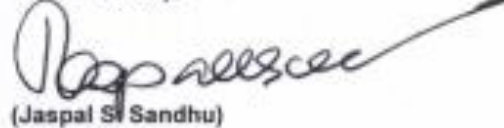
l-4 AUG 2016

Dear Sir/Madam,

The University Grants Commission (UGC) has launched a scheme on skill development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exit options such as Diploma/Advanced Diploma under the NSQF. The B.Voc. programme is focussed on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their National Occupational Standards (NOSs) alongwith broad based general education.

In order to, look into new developments and consider the candidates passing out of B.Voc. Degree Programme as per eligibility requirements, it is requested to implement the following:

(i)   Bachelor of Vocation (B.Voc.), a Bachelor level degree specified by UGC under section 22(3) of UGC Act, 1956 and notified in official Gazette of India dated 19th January, 2013 be recognised at par with the other Bachelor level degrees for competitive exams conducted by Union/State Public Service Commission, Staff Selection Commission or other such bodies where the eligibility criteria is "Bachelor Degree in any discipline".

(ii) Students with B.Voc. Degree should be considered eligible for the trans disciplinary vertical mobility into such courses where entry qualification is a Bachelor Degree without specific requirement in a particular discipline.
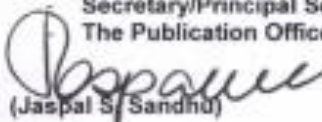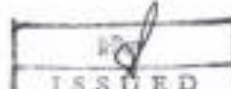
With kind regards,

Yours sincerely,

(Jaspal S. Sandhu)

The Vice-Chancellor of all Universities.

Copy to :

- Secretary/Principal Secretary (Higher Education), All States and UTs
  The Publication Officer, UGC, New Delhi for uploading on UGC website.

(Jaspal S. Sandhu)

ISSUED

भारत का राजपत्र
The Gazette of India

साप्ताहिक/WEEKLY

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके

(Separate paging is given to this Part in order that it may be filed as a separate compilation)

UNIVERSITY GRANTS COMMISSION

SPECIFICATION OF DEGREES

NEW DELHI, March, 2014

NO. F. 5-1/2013 (CPP-II)--In exercise of the powers conferred by sub-Section (3) of Section 22 of the University Grants Commission Act, 1956 (3 of 1956) and in supersession of all earlier Gazette Notifications pertaining to specification of degrees, the University Grants Commission (UGC) with the approval of the Central Government hereby specifies the nomenclature of degree for the purposes of the said section.

SPECIFIED DEGREES

Broad discipline-wise nomenclatures of degrees at all levels of higher education should be taken as the specified degree, which the universities/institutions must adhere to, are given below. Alongside the nomenclature of the degrees, minimum entry-level qualifications and duration of the programmes have also been indicated. The information is presented in a tabular form for clarity. In the bottom-most row of each table, nomenclatures of degrees that are presently in vogue in some institutions were found to be neither conventional, nor reflective of a real innovation in knowledge and are de-specified with the suggestion that the same may be restructured/changed as suggested therein.

	Will require restructuring of some degrees being offered by a few universities:		
	BHTM	be restructured as	BHM/ BHMCT /BTTM
	BTA	be restructured as	BTTM/ BBA (Tourism & Travel)
	MTA	be restructured as	MTTM or as MBA (Tourism & Travel Management)
	BHMTT	be restructured as	BHM/BHMCT/BTTM

	Sciences					
	Specified Degrees		Level	Minimum Duration (Years)	Entry Qualification
	Abbreviated	Expanded			
54.	B.Sc./B.Sc. (Hons)	Bachelor of Science/Bachelor of Science (Hons)	BACHELOR'S	3	10+2
55.	M. Sc.	Master of Science	MASTER'S	2	BACHELOR'S
56.	BCA	Bachelor of Computer Applications	BACHELOR'S	3	10+2
57.	MCA	Master of Computer Applications	MASTER'S	3	BACHELOR'S
58.	B. Stat	Bachelor of Statistics	BACHELOR'S	3	10+2
59	M. Stat	Master of Statistics	MASTER'S	2	BACHELOR'S