



## REMOTE WORK OFFER

Ref. No. IN-2020-30684-MU

### Employer Information

**Employer:** Manipal Institute of Technology  
Chemical Engineering  
1st Floor, Academic Block-4, MIT, Manipal  
576104 Manipal  
India

**Website:** <http://www.manipal.edu>

**Location of placement:** Manipal  
**Working hours per week:** 10.0  
**Working hours per day:** 2.0  
**Remote Offer Type:** NA

**Number of employees:** 500

**Business or products:**

### Student Required

**General Discipline:** 14A-ENGINEERING, Other  
40C-CHEMISTRY, MATERIAL SCIENCE, AND  
CHEMICAL ENGINEERING

**Completed years of study:** 2

**Field of Study:** 14.1401-Environmental/Environmental Health  
Engineering.  
40.0509-Environmental Chemistry.

**Student status requirements:** Yes

**Language required:** English Excellent

**Required Knowledge and Experiences:**

**Other requirements:**  
Basic Knowledge of Chemistry

### Work Offered

Removal of arsenic and fluoride from drinking water using a low cost water filter

Detailed Project Description:

Arsenic is an important environmental contaminant of worldwide concern due its high toxicity and natural presence in drinking water in many parts of India. The world health organization has set the limit for arsenic in drinking water as 10 ppb. The WHO and India have a limit of 50 ppb. Fluoride is another common element in water that can cause numerous health problems if present in higher concentration in drinking water and the MCL for fluoride is 1.5 ppm in India. In Gulbarga and Raichur districts of Karnataka, concentration levels higher than allowed limits (1000-2000 ppb arsenic and 2-4 ppm fluoride) are found in groundwater. People in this region complain of various health issues related to arsenic and fluoride toxicity. We propose an affordable gravity operated water filter cartridge for removing arsenic from drinking water. This cartridge can be used in existing water filters and it may be provided at subsidized rates by the government to the below poverty limit (BPL) people. It is designed to bring arsenic content below permissible levels. It also adsorbs suspended solids, arsenic, fluoride, organic matter and makes water safe for consumption. Iron powder of various sizes, different ratios of activated carbon, iron and MnO<sub>2</sub> will be tested and the best alternative will be reported based on the results. The filter cartridge uses activated carbon, iron oxides and MnO<sub>2</sub> to remove arsenic and activated alumina to remove fluoride. It can be fabricated using locally available galvanized iron pipes and costs less than Rs 500. In combination, the filter cartridge removes arsenic, fluoride, suspended solids and organic matter. This filter may be modified for removal of other heavy metals.

Outcomes of the Project:

Model of the filter and a paper on this.

Work Plan:

- 1) A minimum of 2 working hours a day.
- 2) Online meeting once a week over suitable online platform
- 3) A research paper has to be submitted.

**Number of weeks offered:** 8 - 12

**Within the months:** 20-AUG-2020 - 30-NOV-2020

**Gross pay:** 0 INR / Month

**Or within:** -

**Deduction to be expected:** 0

**Company closed within:** -

**Payment method / time of first / payment:**

**Latest possible start date:**

### Additional Information

### Nomination Information

**Deadline for nomination:** 22-AUG-2020

**Date:** 19-AUG-2020 **On behalf of receiving country:** Siddharth Chadha