

## Radiochemistry Training at Shizuoka University and Chubu Electric Power Company's

### Hamaoka Nuclear Power Station

#### 1. Overview

In this practical training, students will acquire basic knowledge of radioactivity and radiation through hands-on training. In the practical training for sealed RI, students will learn that different types of detectors are used for different types and energies of radiation, that the exposure dose is inversely proportional to the distance from the source, and that the principle of radiation measuring instruments is known, as well as measure energy spectra to decipher nuclides and measure the amount of radioactivity. In the practical training for unsealed RI, students learn analysis and evaluation methods using isotope dilution analysis method, and learn how to safely handle and manage tritium, which emits low-energy  $\beta$ -rays, including exposure, contamination, disposal, and storage methods, as well as handling and measurement methods. In particular, the trainees will learn the measurement methods of chemical dosimetry, which is a dosimetry method using large-dose irradiation equipment.

#### 2. Date and Time

Saturday, December 23, 2023 11:00 - Wednesday, December 27, 2023 17:00

#### 3. Place

Hamaoka Nuclear Power Station, Chubu Electric Power Company (Saturday, December 23 to Sunday, December 24)

<https://www.chuden.co.jp/english/>

Shizuoka University (Monday, December 25 through Wednesday, November 27)

<https://www.shizuoka.ac.jp/english/>

#### 4. Practice Schedule

- **Practical training at Hamaoka Nuclear Power Station**

See Attachment 1 for details.

Buses will take you to Hamaoka Nuclear Power Station.

**Meeting time and date: Saturday, December 23, 11:00 a.m. (departure at 11:10 a.m.)**

**Meeting place: Shizuoka Station South Exit (in front of Suruga Bank Shizuoka South**

Branch) See the figure below.

or

Meeting time and date: Saturday, December 23, 11:30 a.m. (departure at 11:40 a.m.)

Meeting place: In front of the Faculty of Science, Shizuoka University

Please finish lunch on your own and come to the meeting place.



Meeting place: Shizuoka Station South Exit (in front of Suruga Bank Shizuoka South Branch)

Dismissal Location: Sunday, December 24, around 7:00 p.m.

Dismissal Location: Shizuoka University Faculty of Science, or Shizuoka Station South Exit (in front of Suruga Bank Shizuoka South Branch)

• **Shizuoka University Practice**

See Appendix 2 for details.

Be sure to check the bus schedule the day before. It takes about 25-30 minutes by bus from Shizuoka Station to Shizuoka University. (Shizutetsu Just Line buses can be used with IC cards such as Suica.)

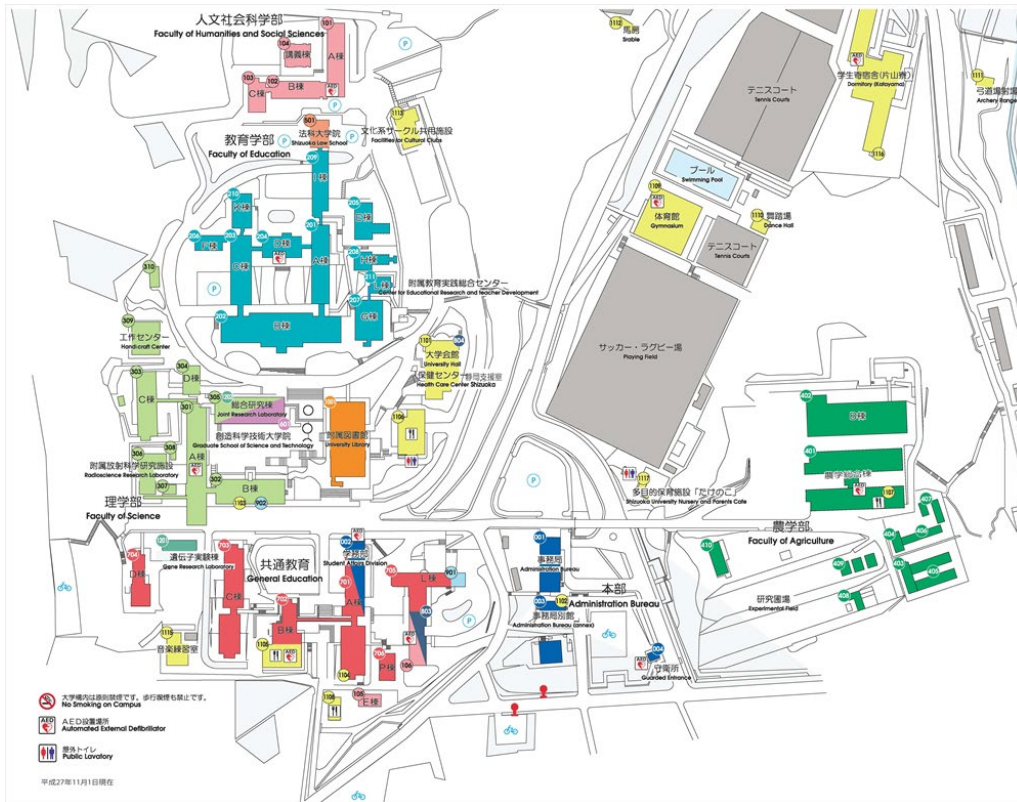
Meeting time and date: Monday, December 25, 8:30 a.m.

Meeting place: Main Conference Room, Faculty of Science, Shizuoka University

## Shizuoka Campus (Building A, 2F: Building No. 301)

See below for access from Shizuoka Station.

<https://www.shizuoka.ac.jp/english/access/>



### Emergency Contacts

Yasuhisa Oya

Hiroshi Nakashima

### 5. Lodging

Basically, you must secure your own lodging.

- Since the meeting will be held on December 23 at 11:00 a.m., those coming from far away can stay the night before: on the 22nd. Please consult with the secretariat.
- If you cannot arrive at your home on December 27, you can stay overnight on the 27th.
- **The following accommodations have been secured for the night of December 23 only for the Hamaoka Nuclear Power Plant training.**

Keruke inn Omaezaki

Omaezaki, Shizuoka 437-1612

7644 Ike-Shinden, Omaezaki-shi, Shizuoka-ken

TEL: 0537-85-1211 FAX:0537-85-1212

<https://kuretake--inn->

[com.translate.goog/hotel/omaezaki?\\_x\\_tr\\_sl=ja&\\_x\\_tr\\_tl=en&\\_x\\_tr\\_hl=ja](https://kuretake--inn-com.translate.goog/hotel/omaezaki?_x_tr_sl=ja&_x_tr_tl=en&_x_tr_hl=ja)

Email:omaezaki@kuretake-inn.com

## 6. Travel expenses

The prescribed transportation, lodging (9,800 yen/day), and daily allowance (2,200 yen/day) will be transferred to the designated account at a later date. Please contact us for the designated account. (However, the secretariat will pay all the expenses for Kuretake Inn Omaezaki in one lump sum.)

## 7. Various procedures

• Shizuoka University - Radiation Worker Registration Application (New) and Radiation Worker Authorization Form

**If you are a Radiation Worker at your university**, please fill out Attachment 3 (Application for Radiation Worker Registration (New)) and Attachment 4 (Radiation Worker Authorization Form) and bring the originals with you on the day of the Radiation Worker Registration. Please submit a copy in PDF format in advance. Also, please bring a personal radiation dosimeter from your organization on the day of the application.

**If you are not a radiation worker at your university**, please contact us as soon as possible. Prior education and medical examinations are required.

• Certificate showing education and training, special medical examination, and exposure history

Please have the chief radiation protection supervisor prepare these certificates in the form of each university, and bring the originals with you on the day. In addition, please submit a copy of the certificate as a PDF file in advance.

## 8. Prior learning

• The hands-on textbook "Radiation Measurement and Safety Handling, Second Edition" is available on demand from Amazon. Please purchase your own copy in advance from Amazon.

<https://www.amazon.co.jp/%E7%AC%AC%E4%BA%8C%E7%89%88-%E6%94%BE%E5>

[https://www.open-ed.hokudai.ac.jp/nucl-eng-edu-archives/4864741697/ref=sr\\_1\\_1?crd=QMXHR2GTHOSB&keywords=%E6%94%BE%E5%B0%84%E7%B7%9A%E8%A8%88%E6%B8%AC%E3%81%A8%E5%AE%89%E5%85%A8%E5%8F%96%E6%89%B1-%E5%A4%A7%E7%9F%A2%E6%81%AD%E4%B9%85/dp/4864741697/ref=sr\\_1\\_1?crd=QMXHR2GTHOSB&keywords=%E6%94%BE%E5%B0%84%E7%B7%9A%E8%A8%88%E6%B8%AC%E3%81%A8%E5%AE%89%E5%85%A8%E5%8F%96%E6%89%B1&qid=1670196225&srefix=%2Caps%2C154&sr=8-1](https://www.open-ed.hokudai.ac.jp/nucl-eng-edu-archives/4864741697/ref=sr_1_1?crd=QMXHR2GTHOSB&keywords=%E6%94%BE%E5%B0%84%E7%B7%9A%E8%A8%88%E6%B8%AC%E3%81%A8%E5%AE%89%E5%85%A8%E5%8F%96%E6%89%B1-%E5%A4%A7%E7%9F%A2%E6%81%AD%E4%B9%85/dp/4864741697/ref=sr_1_1?crd=QMXHR2GTHOSB&keywords=%E6%94%BE%E5%B0%84%E7%B7%9A%E8%A8%88%E6%B8%AC%E3%81%A8%E5%AE%89%E5%85%A8%E5%8F%96%E6%89%B1&qid=1670196225&srefix=%2Caps%2C154&sr=8-1)

• Before participating in the practical training, please study the following study materials in advance.

These can be viewed at <https://www.open-ed.hokudai.ac.jp/nucl-eng-edu-archives/> or by clicking on the titles after ► below to view the respective online lectures.

### Introduction to radiochemistry

- ▶ [Radioactive Necrosis and Radioactivity \(Takumi Chikada\)](#)
- ▶ [Radiative Equilibrium and Natural Radionuclides \(Takumi Chikada\)](#)
- ▶ [Use of RI for Chemical Analysis \(Yasuhisa Oya\)](#)
- ▶ [Chemical Use as a Tracer \(Yasuhisa Oya\)](#)
- ▶ [Nuclear Reaction\[1\]-What is nuclear reaction \(Makoto Yanaga\)](#)
- ▶ [Nuclear reaction \[2\]-RI production and its application to analysis \(Makoto Yanaga\)](#)
- ▶ [Fission Reactions and Handling of Radionuclides \(Makoto Yanaga\)](#)
- ▶ [Hot Atom Chemical \(Takumi Chikada\)](#)
- ▶ [Radiation Chemistry \(Yasuhisa Oya\)](#)

### 9. Precautions

• **If you feel unwell, please contact us immediately.** If you have reservations for transportation, lodging, etc., please cancel them. If a cancellation fee is required, please request it later to the secretariat along with a receipt.

• (You may wear short sleeves because you will be wearing a yellow lab coat on top.) (The top is a yellow lab coat, so short sleeves are fine).

• Lunch is basically on your own. There is a Family Mart near the university. **However, lunch will be provided on December 24. We will collect 1,000 yen on the day.**

• Deadlines for report submission will be communicated at a later date. **If a report is not submitted, travel expenses cannot be reimbursed.**

Submission address: By mail

To: Takeshi Atsumi, Office of the Center for Education and Research Promotion of Radiation Science, Faculty of Science, Shizuoka University, 836 Otani,

November 21, 2023

ANEC Office

Suruga-ku, Shizuoka City, 422-8529, Japan  
Or, send an electronic file in PDF format to  
[atsumi.takeshi@shizuoka.ac.jp](mailto:atsumi.takeshi@shizuoka.ac.jp)  
(Maximum file size is 10 M.)

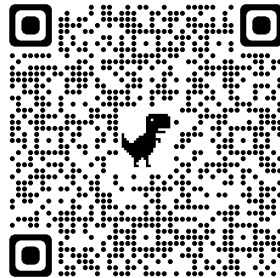
• Sandals and Crocs are strictly prohibited at Hamaoka Nuclear Power Station. Please wear athletic shoes.

• Upon entering Hamaoka Nuclear Power Station, visitors are required to present identification. Be sure to **bring your ID (driver's license, my number card)**. You will not be able to practice. You must have the same identification as you declared in advance.

In addition, please read Attachment 5 (Entrance Guide) and Attachment 6 (Precautions for practical training at Hamaoka Nuclear Power Station) carefully and observe all precautions.

10. Questionnaire carried out in advance

Please cooperate with us by filling out the preliminary questionnaire. Please read the QR code below with your smart phone and respond by **Monday, December 18**.



We will also ask for your cooperation after the training is over, as we will conduct a questionnaire afterwards to see the effects of this tour.

and upwards

November 21, 2023

ANEC Office

Attachment 1

Hamaoka Nuclear Power Station Training Schedule (in preparation)

November 21, 2023  
ANEC Office

Attachment 2

Shizuoka University Radiochemistry Practicum Program (in progress)