ITFI – Project I: The Surface Shaped by Coal Mining

Jining, a major coal-producing city in Shandong Province, China, boasts abundant coal resources with an annual production capacity of 75 million tons, accounting for nearly half of the province's total output. The city's coal mining industry, centered in areas like the Yanzhou-Jining coalfield, has driven economic growth but also led to significant environmental challenges, particularly land subsidence caused by underground mining activities.

As coal is extracted, the ground above the mines can sink, forming subsidence basins or even permanent waterlogged areas. Jining has already seen over 415,000 acres of subsided land, with 230,000 acres submerged. This phenomenon disrupts farmland, damages infrastructure, and alters local ecosystems.

To mitigate these impacts, Jining has implemented various ecological restoration projects, transforming subsidence areas into arable land, aquaculture zones, and solar power farms.

Coal gangue is solid waste produced during the coal mining and coal washing processes. Here, decades of coal mining have produced a large amount of coal gangue, which has accumulated on the ground surface and formed a small hill (Huishan Park). The local government has covered the large pile with soil and planted plants on it for ecological restoration. But some evidence can still be found on the bare ground of the hillside which is eroded by water, or on the top of the hill.

We are visiting the Taiping National Wetland Park and Huishan Park in Jining, Shandong, which was formed by ecological restoration of land subsided due to coal mining. This site provides a rare opportunity to study how human activities alter the Earth system, and how ecological engineering can be used to repair damage.

After the field work, your team should prepare a presentation which should last for **20 minutes**. There will be a **5-minute Q&A** session after the presentation. Each member of the team should participate in the presentation.

To download the digital version of this file and other related files, please visit the following website or scan the QR code:
https://disk.pku.edu.cn/link/AA57E780D4E90147B0B9D06F54151721F5

Potential Research Questions

1. **How has the local environment been affected by coal mining, land subsidence, and subsequent wetland restoration?**
2. **What approaches have been or could be used to evaluate the effectiveness of ecological restoration or to propose sustainable reuse of the land?**

   (You may address one or more of the issues above, or investigate other problems identified at the study site.)

The Fieldwork

You will explore selected zones within the Taiping Wetland Park. You are encouraged to:

- Observe landscape features and ecosystems (document with photos and notes).
- Identify subsiding areas and examine their impact on the surface environment.
- Investigate how people manage and repurpose coal mining subsidence zones.
- Collect water, soil, or rock samples from representative areas for laboratory analysis. Exercise caution when collecting samples.
- When you return to school, please **follow the volunteers** to store your samples in the laboratory (Preparation Room) immediately. Air-dry your soil samples if necessary.

Equipment provided (receive on bus):

Equipment	**Amount (per team)**
Hammer	2
Magnifier	6
Shovel	2
Gloves	2 Pairs
Hydrochloric acid	2 Bottles
Sample bag	6
Water collection kit (bottle + rope):	4
Marker pen	4

When you collect water samples, you can use one rope to tie the bottle. If necessary, pick up a stone as a counterweight, as shown in the picture above

If the weather doesn't permit you to go to the site,, you will skip the fieldwork and use pre-collected samples for laboratory analysis.

The Lab Work

All analyses will be conducted in the laboratory. The Laboratory time for Project I is from **14:00 to 18:00 on August 13th**, and the lab is located in **Room 105 of the Administration Building**. If you require lab analysis, please send **no more than 2** skilled team members to the lab. Before conducting any lab work, please read the Laboratory Work Guidelines (Appendix B) and Laboratory Work Reference (refer to another document) carefully.

The laboratory provides multiple analytical methods (see Appendix B). Please design your experimental plan according to your sample type and research objectives.

Timetable

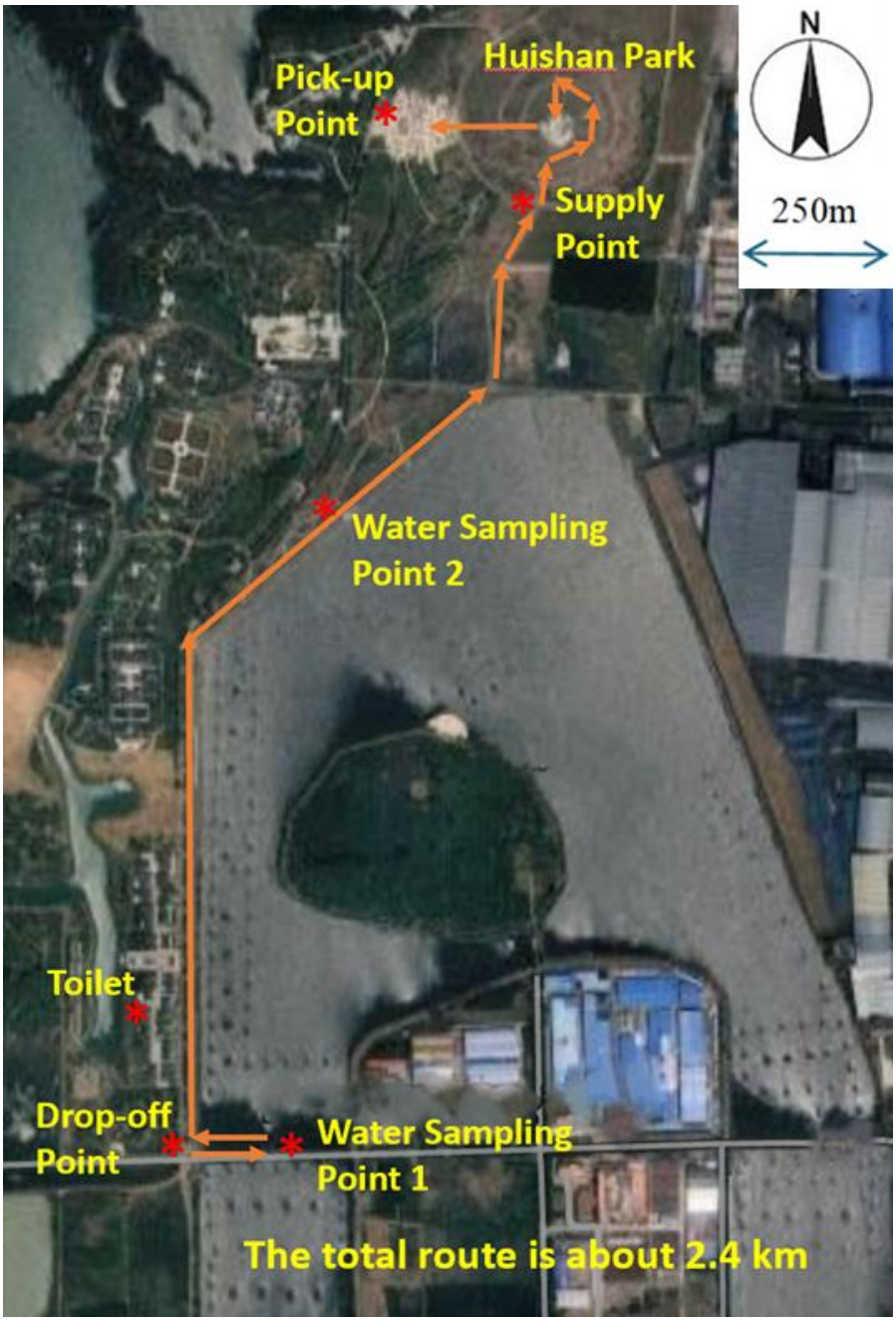
- Departure: August 13th 7:30
- Fieldwork: August 13 morning (~2 hours) – Observation, documentation, and sampling
- Lab work: August 13 (14:00–18:00)
- Presentation preparation: Before **August 14th, 22:00**.
- The presentation will be on August 15th starting from 8:00, the detailed schedule is listed below.

Session 1 – ITFI-1 Room 201, 202, Junior High Department		Session 2 – ITFI-2 Room 203, 204, Junior High Department		Session 3 – ITFI-3 Room 205, 206, Junior High Department	
08:00 – 08:25	Team L	08:00 – 08:25	Team S	08:00 – 08:25	Team N
08:25 – 08:50	Team M	08:25 – 08:50	Team K	08:25 – 08:50	Team C
08:50 – 09:15	Team I	08:50 – 09:15	Team Q	08:50 – 09:15	Team P
09:15 – 09:40	Team F	09:15 – 09:40	Team D	09:15 – 09:40	Team R
09:40 – 10:00	Break	09:40 – 10:00	Break	09:40 – 10:00	Break
10:00 – 10:25	Team O	10:00 – 10:25	Team H	10:00 – 10:25	Team E
10:25 – 10:50	Team J	10:25 – 10:50	Team B	10:25 – 10:50	Team T
10:50 – 11:15	Team A	10:50 – 11:15	Team G		

Submission

All teams must submit a presentation (PPT or PDF) before August 14th, 22:00. Please name your file in the format: Team- [Your Team Code]-ITFI- [Project Number]. For example, if you are Team A and working on Project I, your filename should be: Team-A-ITFI-I. Link for uploading: https://disk.pku.edu.cn/link/AAB373817B7AC04C53AE02A0D2B05C2C8E

Appendix A — Satellite Map of the Taiping National Wetland Park



Note: 1. You will be dropped off and picked up at the designated point as shown on the map.

2. You are encouraged to follow the designated route on the map. Some suitable sampling points along the route are also provided. You can also choose to take samples in suitable areas along the route that you consider suitable, as long as you don't deviate too far from the path. At any time, **SAFETY FIRST**.

3. We won't restrict the time for sampling, but you still need to control your time as the time is limited for field investigation.

4. Be aware of sunburn and heatstroke. If you feel unwell, please inform our volunteers immediately.

5. **IMPORTANT: Acting alone is prohibited, you must follow the team volunteers during the field investigation.**

6. You can obtain additional satellite imagery through ArcGIS or other remote sensing softwares, which can serve as evidence to support your research findings. (As an option, you can simply use: https://www.arcgis.com/apps/mapviewer/index.html.

Appendix B — ITFI Laboratory Work Guidelines

Welcome to the laboratory session of the ITFI project! In this phase of the program, your team will analyze and test the samples collected during field investigations to acquire critical data for your final report.

Please assign no more than two team members to lead this analytical work. These members should have normal color vision (no color blindness or color weakness), and no serious allergies at present. This laboratory session is shared between Project I and Project II, and the same guidelines apply to both.

The emphasis is on exploration and hands-on experience—we hope you enjoy your time in the lab!

Physical and chemical analyses cannot replace your careful observation and description of the sample. *Sometimes, your eyes are the most powerful instrument.*

Before using the laboratory, prepare your experimental plan using this appendix and any additional information you have gathered in advance. Although only two members from each team may enter the laboratory, all team members should take part in the design of the experimental procedures. Collaboration beforehand will ensure that the analytical work is efficient and targeted.

Each team will be provided with two printed copies of the *ITFI Laboratory Work References*. The students performing the experiments must consult these references during the session. A digital version is also available by scanning the QR code printed in the main text of your team's ITFI paper. The references outline a total of 11 experiments. Each experiment is labeled with a **difficulty level**, using atmospheric layers (e.g., Troposphere, Stratosphere) to represent increasing complexity. **The higher the layer, the more challenging the task.** Please select experiments that align with your team's skills and objectives. Rest assured, **your choice of experiments will not impact the final evaluation.**

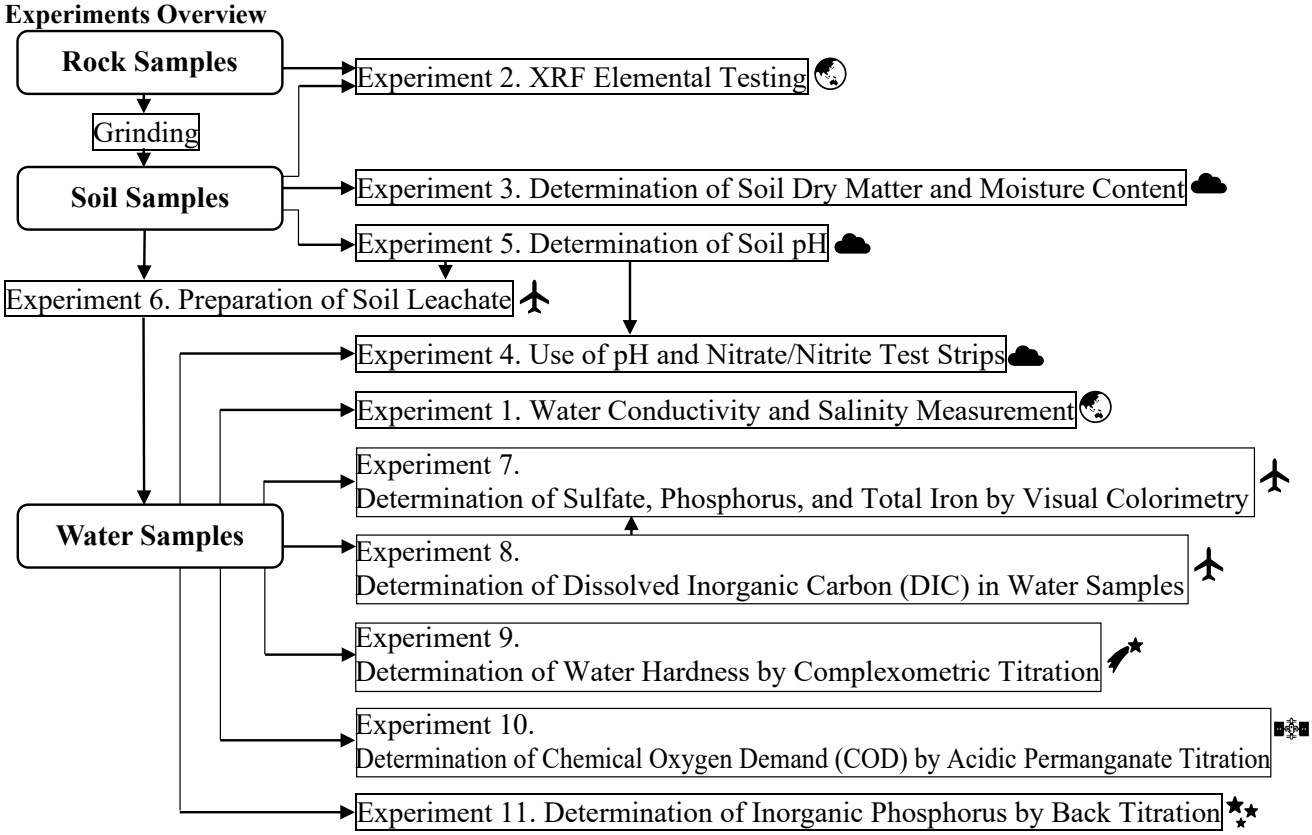
Useful Tips

One of the *Operative Objectives* in the IESO syllabus is *to use Earth science as a tool to illustrate chemical, physical, and biological principles*. By studying Earth science, you not only gain **knowledge**, but also develop valuable **skills**—such as observation, analysis, integration of information from multiple disciplines, and problem-solving in real-world contexts.

This year's ITFI laboratory work materials, including both the guidelines and the references, have been primarily designed and written by former IESO participants. The laboratory work session for this year's ITFI is not intended to test your chemistry knowledge (which will be given if necessary), but designed to assess the **skills and ways of thinking** you have developed through learning Earth science. For instance, a solid understanding of Earth system interactions—such as between the lithosphere and hydrosphere—enables you to conceive innovative approaches like preparing soil leachates from soil samples and subsequently applying water sample analysis techniques to these leachates.

We hope you will approach this laboratory session with curiosity, creativity, and collaboration. May your time in the lab be both productive and inspiring, and may your findings bring new insight to your team's investigation. Good luck!

Experiments Overview



Laboratory Seating Arrangement

Room 105, the Examination Room

	Blackboard	Circuit Breaker Door #105
	Staff's Workstation (Public Instruments & Reagents)	

Window

WS Cambrian (Ꞓ)	**WS Ordovician (O)**	**WS Neogene (N)**	**WS Quaternary (Q)**
Instruments and Reagents for Ꞓ, O, S, and D		Instruments and Reagents for K, E, N, and Q	
WS Silurian (S)	**WS Devonian (D)**	**WS Cretaceous (K)**	**WS Paleogene (E)**
WS Carboniferous (C)	**WS Permian (P)**	**WS Triassic (T)**	**WS Jurassic (J)**
Instruments and Reagents for C, P, T, and J		Staff's Workstation	

Fire Extinguisher | Door #107

WS = Workstation

Workstation		Ꞓ	O	S	D	C	P	T	J	K	E	N	Q
PM, Aug. 13	Team	F	O	L	J	—	—	—	—	I	A	M	—
AM, Aug. 14		H	B	S	D	—	—	—	—	K	G	Q	—

Room 109, the Preparation Room

	Blackboard	Circuit Breaker Door #109
	Unused	

Window

Team A	**Team F**	**Team K**	Unused
Team B	**Team G**	**Team L**	**Team Q**
Unused	**Team H**	**Team M**	Unused
Team D	**Team I**	Unused	**Team S**
Unused	**Team J**	**Team O**	

Fire Extinguisher | Door #111

Appendix C — Criteria for AI Usage

- During the first jury meeting, brief discussion about how AI is used in the field by professionals. We are here to model that:
  - AI is a supporting tool, not an independent author. It can be used in cases like:
    - **Language and style editing** (especially for non-native speakers).
    - **Brainstorming** research questions or outlines.
    - **Summarizing** large volumes of literature **(after verifying accuracy)**.
    - Generating **code or workflow** examples (**with review**).
    - **Formatting** references or structuring documents.
    - **Discourage usage** for AI art/diffusion models.
- However, it should not be used in :
  - Passing off AI-generated text or data as your own **without disclosure**.
  - Using AI to **fabricate data, results, or sources**.
  - Letting AI perform **core intellectual work** (formulating the main arguments or interpretations) without substantial human oversight.
- Works with the assistance of AI **must include AI usage statement**: How did you use AI? What percentage, what use cases?
    - For example:

Portions of this manuscript were drafted and refined with the assistance of OpenAI's ChatGPT (GPT-5, August 2025 version). AI was used for approximately 15% of the text, primarily for language polishing, summarizing background literature, and generating alternative phrasing. All AI-generated content was reviewed, fact-checked, and edited by the authors to ensure accuracy and appropriateness.

- They also must **include AI citations**:
    - For example:

Reference list: *OpenAI. (2025, August 8). Response to "How do I write AI citation in academic conditions?" [ChatGPT output]. ChatGPT.* https://chat.openai.com/

In-text citation: *(OpenAI, 2025)*

ITFI – Project II: Weathering of Rock and Soil

We will visit Yangshan Geopark, located at the boundary between the hills of southwestern Shandong and the piedmont plains. This site holds significant historical and cultural importance. Quarrying activities in the last century shaped its unique 'lake within mountains' and cliff landscapes, exposing the region's rock and soil layers to intense weathering.

After the field work, your team should prepare a presentation which should last for **20 minutes**. There will be a **5-minute Q&A** session after the presentation. Each member of the team should participate in the presentation.

To download the digital version of this file and other related files, please visit the following website or scan the QR code:
https://disk.pku.edu.cn/link/AA57E780D4E90147B0B9D06F54151721F5

Potential Research Questions

1. **How did rock weathering in this area impact the atmosphere and hydrosphere?**
2. **What types of weathering occur here, and what Earth system factors contribute to them?**
3. **How can we mitigate the damaging effects caused by weathering on these historical relics?**

(You may address one or more of the issues above, or investigate other problems identified at the study site.)

The Fieldwork

You will explore selected zones within the Yangshan Geopark. You are encouraged to:

- Observe and document the overall geomorphological features of the area.
- At lower elevation zones, identify and record the local rock types and rock weathering phenomena.

- At higher elevation zones, identify and record the local soil profiles and soil weathering phenomena.
- Estimate weathering intensity using visual criteria.
- Note and map any evidence of slope instability or potential geohazards.
- Collect water, soil, or rock samples from representative areas for laboratory analysis. **Collect samples only when it does not compromise your safety or the stability of rocks/soil. Do not sample any ornamental stones** (those engraved with Chinese characters). Please ask your team volunteers if you are not sure whether sampling is permitted.
- When you return to school, please **follow the volunteers** to store your samples in the laboratory (Preparation Room). Air-dry your soil samples if necessary.

Equipment provided (receive on bus):

Equipment	**Amount (per team)**
Hammer	2
Magnifier	6
Shovel	2
Gloves	2 Pairs
Hydrochloric acid	2 Bottles
Sample bag	6
Water collection kit (bottle + rope):	4
Marker pen	4

When you collect water samples, you can use one rope to tie the bottle. If necessary, pick up a stone as a counterweight, as shown in the picture above

If the weather doesn't permit you to go to the site, you will skip the fieldwork and use pre-collected samples for laboratory analysis.

The Lab Work

All analyses will be conducted in the laboratory. The Laboratory time for Project II is from **8:00 to 12:00 on August 14th**, and the lab is located in **Room 105 of the Administration Building**. If you require lab analysis, please send **no more than 2** skilled team members to the lab. Before conducting any lab work, please read the Laboratory Work Guidelines

(Appendix B) and Laboratory Work Reference (refer to another document) carefully.

The laboratory provides multiple analytical methods (see Appendix B). Please design your experimental plan according to your sample type and research objectives.

Timetable

- Departure: August 13th 7:30
- Fieldwork: August 13th morning (9:30-12:00, about 2.5 hours) – Observation, documentation, and sampling
- Lab work: Morning of August 14th (8:00–12:00)
- Presentation preparation: Before **August 14th, 22:00**.
- The presentation will be on August 15th starting from 8:00, the detailed schedule is listed below.

Session 1 – ITFI-1 Room 201, 202, Junior High Department		Session 2 – ITFI-2 Room 203, 204, Junior High Department		Session 3 – ITFI-3 Room 205, 206, Junior High Department	
08:00 – 08:25	Team L	08:00 – 08:25	Team S	08:00 – 08:25	Team N
08:25 – 08:50	Team M	08:25 – 08:50	Team K	08:25 – 08:50	Team C
08:50 – 09:15	Team I	08:50 – 09:15	Team Q	08:50 – 09:15	Team P
09:15 – 09:40	Team F	09:15 – 09:40	Team D	09:15 – 09:40	Team R
09:40 – 10:00	Break	09:40 – 10:00	Break	09:40 – 10:00	Break
10:00 – 10:25	Team O	10:00 – 10:25	Team H	10:00 – 10:25	Team E
10:25 – 10:50	Team J	10:25 – 10:50	Team B	10:25 – 10:50	Team T
10:50 – 11:15	Team A	10:50 – 11:15	Team G		

Submission

All teams must submit a presentation (PPT or PDF) before August 14th, 22:00. Please name your file in the format: Team- [Your Team Code]-ITFI- [Project Number]. For example, if you are Team A and working on Project I, your filename should be: Team-A-ITFI-I. Link for uploading: https://disk.pku.edu.cn/link/AAB373817B7AC04C53AE02A0D2B05C2C8E

Appendix A — Tourist Map of the Yangshan Geopark

At the beginning of the field trip, we will first get off the bus at the **drop off point** (inverted red triangle) and walk together towards the **dismissal point** through the route demonstrated in purple dashed line. Then, your own exploration begins! You may plan your own route to explore the entire area. It is strongly recommended that your team decide on your route before the field trip begins, as this will make your exploration much more organized and efficient.

The investigation area is highlighted in this map of Yangshan Geopark. You must remain within the investigation area at all times. But don't worry! Volunteers will stay on the boundary of this area to ensure no one goes beyond it. If you believe your team may be lost, inform your volunteer immediately. This will NOT influence your performance for ITFI. Regardless of the route you take, your team must **reach the pick-up point (red triangle) by 12:00**.

Water and medicine will be supplied at the **supply stations**. In case of heavy rain, proceed to the nearest **rain shelter**.

IMPORTANT: Acting alone is prohibited, you must follow the team volunteers during the field investigation.

Appendix B — ITFI Laboratory Work Guidelines

Welcome to the laboratory session of the ITFI project! In this phase of the program, your team will analyze and test the samples collected during field investigations to acquire critical data for your final report.

Please assign no more than two team members to lead this analytical work. These members should have normal color vision (no color blindness or color weakness), and no serious allergies at present. This laboratory session is shared between Project I and Project II, and the same guidelines apply to both.

The emphasis is on exploration and hands-on experience—we hope you enjoy your time in the lab!

Physical and chemical analyses cannot replace your careful observation and description of the sample. *Sometimes, your eyes are the most powerful instrument.*

Before using the laboratory, prepare your experimental plan using this appendix and any additional information you have gathered in advance. Although only two members from each team may enter the laboratory, all team members should take part in the design of the experimental procedures. Collaboration beforehand will ensure that the analytical work is efficient and targeted.

Each team will be provided with two printed copies of the *ITFI Laboratory Work References*. The students performing the experiments must consult these references during the session. A digital version is also available by scanning the QR code printed in the main text of your team's ITFI paper. The references outline a total of 11 experiments. Each experiment is labeled with a **difficulty level**, using atmospheric layers (e.g., Troposphere, Stratosphere) to represent increasing complexity. **The higher the layer, the more challenging the task.** Please select experiments that align with your team's skills and objectives. Rest assured, **your choice of experiments will not impact the final evaluation.**

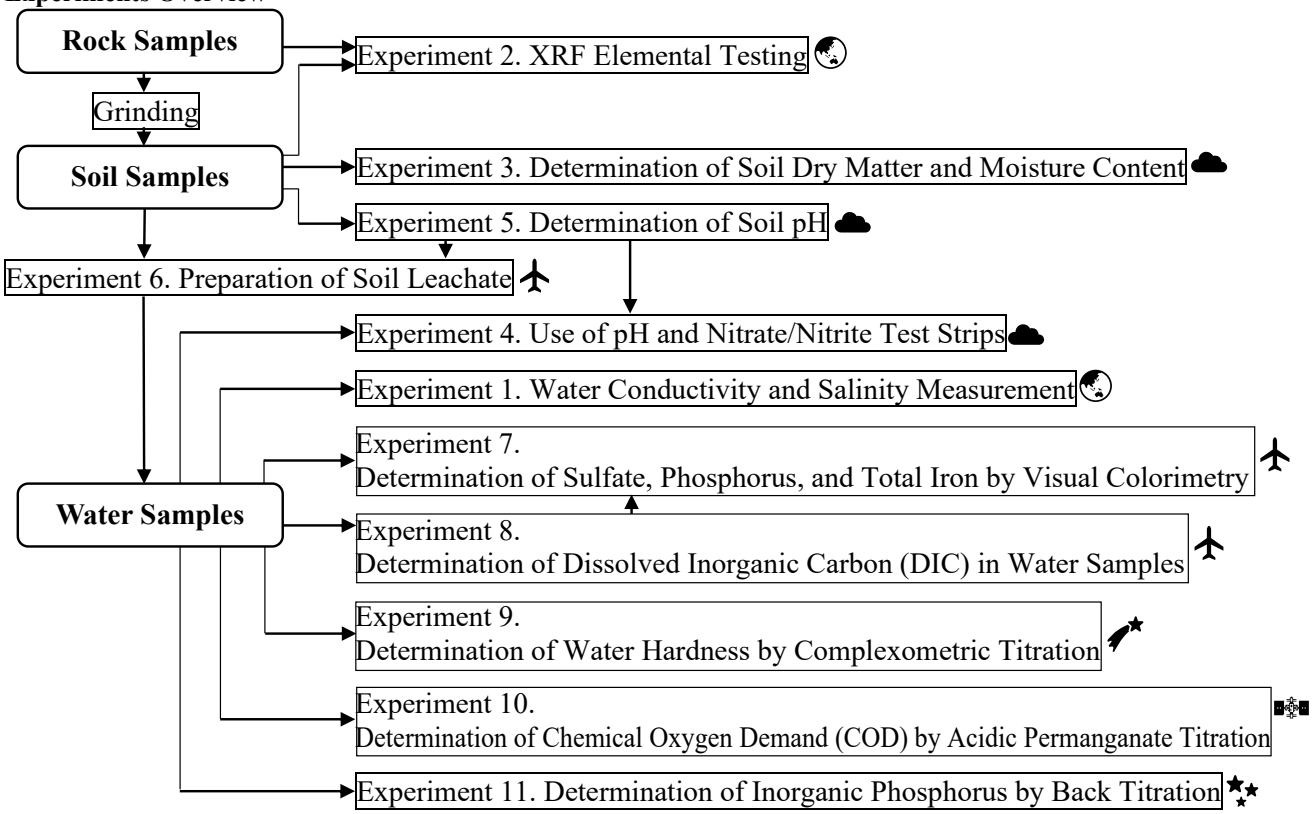
Useful Tips

One of the *Operative Objectives* in the IESO syllabus is *to use Earth science as a tool to illustrate chemical, physical, and biological principles*. By studying Earth science, you not only gain **knowledge**, but also develop valuable **skills**—such as observation, analysis, integration of information from multiple disciplines, and problem-solving in real-world contexts.

This year's ITFI laboratory work materials, including both the guidelines and the references, have been primarily designed and written by former IESO participants. The laboratory work session for this year's ITFI is not intended to test your chemistry knowledge (which will be given if necessary), but designed to assess the **skills and ways of thinking** you have developed through learning Earth science. For instance, a solid understanding of Earth system interactions—such as between the lithosphere and hydrosphere—enables you to conceive innovative approaches like preparing soil leachates from soil samples and subsequently applying water sample analysis techniques to these leachates.

We hope you will approach this laboratory session with curiosity, creativity, and collaboration. May your time in the lab be both productive and inspiring, and may your findings bring new insight to your team's investigation. Good luck!

Experiments Overview



Laboratory Seating Arrangement

Room 105, the Examination Room

Blackboard | Circuit Breaker

Staff's Workstation (Public Instruments & Reagents) | Door #105

Window

WS Cambrian (Є)	**WS Ordovician (O)**
Instruments and Reagents for Є, O, S, and D	
WS Silurian (S)	**WS Devonian (D)**
WS Carboniferous (C)	**WS Permian (P)**
Instruments and Reagents for C, P, T, and J	

WS Neogene (N)	**WS Quaternary (Q)**
Instruments and Reagents for K, E, N, and Q	
WS Cretaceous (K)	**WS Paleogene (E)**
WS Triassic (T)	**WS Jurassic (J)**
Staff's Workstation	

Fire Extinguisher | Door #107

WS = Workstation

Workstation		Є	O	S	D	C	P	T	J	K	E	N	Q
PM, Aug. 13	Team	F	O	L	J	—	—	—	—	I	A	M	—
AM, Aug. 14		H	B	S	D	—	—	—	—	K	G	Q	—

Room 109, the Preparation Room

Blackboard | Circuit Breaker

Unused | Door #109

Window

Team A	**Team F**
Team B	**Team G**
Unused	**Team H**
Team D	**Team I**
Unused	**Team J**

Team K	Unused
Team L	**Team Q**
Team M	Unused
Unused	**Team S**
Team O	

Fire Extinguisher | Door #111

Appendix C — Criteria for AI Usage

- During the first jury meeting, brief discussion about how AI is used in the field by professionals. We are here to model that:
  - AI is a supporting tool, not an independent author. It can be used in cases like:
    - **Language and style editing** (especially for non-native speakers).
    - **Brainstorming** research questions or outlines.
    - **Summarizing** large volumes of literature **(after verifying accuracy)**.
    - Generating **code or workflow** examples (**with review**).
    - **Formatting** references or structuring documents.
    - **Discourage usage** for AI art/diffusion models.
- However, it should not be used in :
  - Passing off AI-generated text or data as your own **without disclosure**.
  - Using AI to **fabricate data, results, or sources**.
  - Letting AI perform **core intellectual work** (formulating the main arguments or interpretations) without substantial human oversight.
- Works with the assistance of AI **must include AI usage statement**: How did you use AI? What percentage, what use cases?
    - For example:

Portions of this manuscript were drafted and refined with the assistance of OpenAI's ChatGPT (GPT-5, August 2025 version). AI was used for approximately 15% of the text, primarily for language polishing, summarizing background literature, and generating alternative phrasing. All AI-generated content was reviewed, fact-checked, and edited by the authors to ensure accuracy and appropriateness.

- They also must **include AI citations**:
    - For example:

Reference list: *OpenAI. (2025, August 8). Response to "How do I write AI citation in academic conditions?" [ChatGPT output]. ChatGPT.* https://chat.openai.com/

In-text citation: *(OpenAI, 2025)*

ITFI – Project III: The Grand Canal Relics

Jining, known as the "Capital of the Grand Canal," played a pivotal role in China's ancient waterway system. At the heart of this legacy lies the Nanwang Junction, one of the most ingenious hydraulic projects of the Ming Dynasty (1411 AD). This engineering masterpiece was designed to overcome a critical challenge: After the original water source dried up, the urging need to maintain the water level became apparent. Nanwang Town sits at the highest elevation point of the Grand Canal (Fig. 1a), which historically caused severe water shortages and disrupted transportation in this section.

To solve this problem, the water conservancy authorities in Ming Dynasty oversaw the construction of a 40 km-long artificial channel, the Xiaowen Canal, which diverted water from a higher-elevation natural river (the Wen River) in the north to Nanwang (Fig. 1b). At the confluence, they installed a precise water distribution system to regulate the north-south flow ratio. This facility, working in coordination with Doumen (sluice gates), reservoirs, and other hydraulic structures, ensured uninterrupted north-south navigation on the Grand Canal, promoting trade and economic development. Historical records indicate that in the 18th century, a boat trip from Nanwang could reach a town 150 km north in six days and a town 150 km south in five days.

The Nanwang Junction remained in operation for nearly 500 years before being buried in the late 19th century due to Yellow River floods, silt accumulation, and poor maintenance. Modern archaeological efforts have restored the original structure of the Nanwang Junction, establishing the Archaeological Site Park of Nanwang Junction. We will visit this UNESCO World Heritage Site to learn how humans transformed and utilized natural river systems.

After the field work, your team should prepare a presentation which should last for **20 minutes**. There will be a **5-minute Q&A** session after the presentation. Each member of the team should participate in the presentation.

To download the digital version of this file and other related files, please visit the following website or scan the QR code:
https://disk.pku.edu.cn/link/AA57E780D4E90147B0B9D06F54151721F5

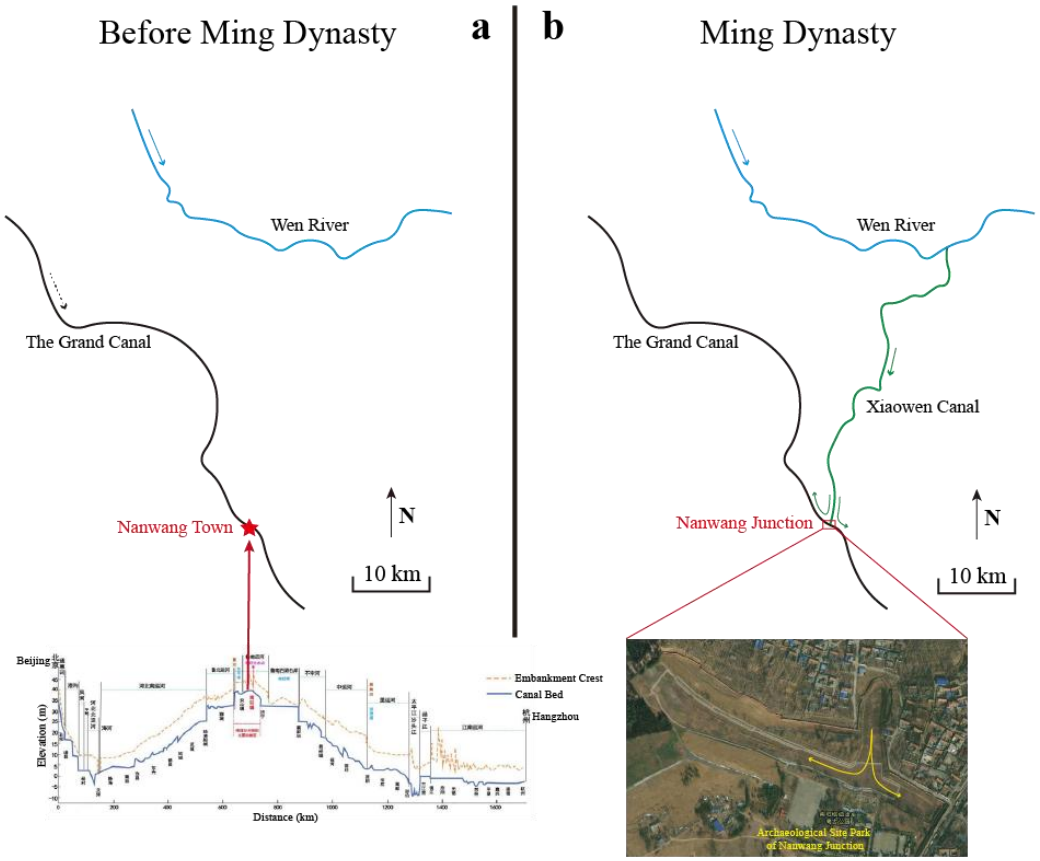


Figure 1 Schematic diagram of the Xiaowen Canal and Nanwang Junction hydraulic project. Only major rivers are shown; other facilities such as dams, sluice gates, and reservoirs are omitted for clarity.

Potential Research Questions

1. **How much earth was excavated during the construction of Xiaowen Canal?**
2. **At Nanwang Junction, after Xiaowen Canal merges with the Grand Canal, what was the controlled flow ratio between the northern and southern directions?**
3. **How much water did Xiaowen Canal supply annually to the Grand Canal?**
4. **Refer to the satellite images. Can you restore more ancient channels of the Grand Canal? Where can the ancient relics of channels be excavated?**
5. **Examine the bricks and stone blocks on the side of river channels and Doumen (sluice gates). The Chinese characters on the bricks indicate they were made in 1497. You are suggested to identify the compositions of bricks and types of rocks, and investigate the factors of weathering on those bricks and rocks.**
6. **Investigate the density and varieties of grasses in the river channels. What can you infer from their distribution?**

(You may address one or more of the issues above, or investigate other problems identified at the study site.)

The Fieldwork

You will explore the restored features of Nanwang Junction. You are encouraged to:

- Identify which canal each section of waterway remnants corresponds to and determine their flow directions.
- Measure the morphological parameters of the canal channels as thoroughly as possible.
- Learn about other hydraulic facilities of the Grand Canal from the local information boards.
- To protect this heritage site, **any sampling is strictly prohibited.**

Equipment provided (receive on bus): 50 m measuring tapes for each team

If the weather doesn't permit you to go to the site, you will skip the fieldwork and observe the morphology of the river channel through satellite images.

The Lab Work

- This project does **NOT** involve chemical analysis, and therefore will **NOT** utilize the chemistry laboratory. Do all your work in the Team Seminar Room or Computer Room after the fieldwork. For all experiments below, utilize your computer for virtual lab work.
- You can obtain satellite imagery through ArcGIS or other remote sensing software, which can serve as evidence to support your research findings. (Simply, you can use [https://www.arcgis.com/apps/mapviewer/index.html.])
- Reconstruct the morphology of each canal section and calculate their average cross-sectional areas. Assume your results are representative of the entire canal system.
- Perform necessary calculations based on your research questions. (Hint: You may use boat speed as a proxy for historical flow velocity.)
- Discuss your findings and interpret their implications.

Timetable

- Departure: August 13th 7:30
- Fieldwork: August 13 morning (1 hour) – Observation and measurement
- Presentation preparation: Before **August 14th, 22:00**.
- The presentation will be on August 15th starting from 8:00, the detailed schedule is listed below (next page).

Session 1 – ITFI-1 Room 201, 202, Junior High Department		Session 2 – ITFI-2 Room 203, 204, Junior High Department		Session 3 – ITFI-3 Room 205, 206, Junior High Department	
08:00 – 08:25	Team L	08:00 – 08:25	Team S	08:00 – 08:25	Team N
08:25 – 08:50	Team M	08:25 – 08:50	Team K	08:25 – 08:50	Team C
08:50 – 09:15	Team I	08:50 – 09:15	Team Q	08:50 – 09:15	Team P
09:15 – 09:40	Team F	09:15 – 09:40	Team D	09:15 – 09:40	Team R
09:40 – 10:00	Break	09:40 – 10:00	Break	09:40 – 10:00	Break
10:00 – 10:25	Team O	10:00 – 10:25	Team H	10:00 – 10:25	Team E
10:25 – 10:50	Team J	10:25 – 10:50	Team B	10:25 – 10:50	Team T
10:50 – 11:15	Team A	10:50 – 11:15	Team G		

Submission

All teams must submit a presentation (PPT or PDF) before August 14th, 22:00. Please name your file in the format: Team- [Your Team Code]-ITFI- [Project Number]. For example, if you are Team A and working on Project I, your filename should be: Team-A-ITFI-I. Link for uploading: https://disk.pku.edu.cn/link/AAB373817B7AC04C53AE02A0D2B05C2C8E

Appendix A — Satellite Map of the Archaeological Site Park of Nanwang Junction

Appendix B — Criteria for AI Usage

• During the first jury meeting, brief discussion about how AI is used in the field by professionals. We are here to model that:

• AI is a supporting tool, not an independent author. It can be used in cases like:

○ **Language and style editing** (especially for non-native speakers).

○ **Brainstorming** research questions or outlines.

○ **Summarizing** large volumes of literature **(after verifying accuracy)**.

○ Generating **code or workflow** examples (**with review**).

○ **Formatting** references or structuring documents.

○ **Discourage usage** for AI art/diffusion models.

• However, it should not be used in :

○ Passing off AI-generated text or data as your own **without disclosure**.

○ Using AI to **fabricate data, results, or sources**.

○ Letting AI perform **core intellectual work** (formulating the main arguments or interpretations) without substantial human oversight.

• Works with the assistance of AI **must include AI usage statement**: How did you use AI? What percentage, what use cases?

○ For example:

Portions of this manuscript were drafted and refined with the assistance of OpenAI's ChatGPT (GPT-5, August 2025 version). AI was used for approximately 15% of the text, primarily for language polishing, summarizing background literature, and generating alternative phrasing. All AI-generated content was reviewed, fact-checked, and edited by the authors to ensure accuracy and appropriateness.

• They also must **include AI citations**:

○ For example:

Reference list: *OpenAI. (2025, August 8). Response to "How do I write AI citation in academic conditions?" [ChatGPT output]. ChatGPT.* https://chat.openai.com/

In-text citation: *(OpenAI, 2025)*