**Wide Area Monitoring, Protection, and Control**

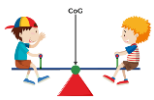
**Instructors:**
**Hassan Bevrani and Hêmin Golpîra**

**Saturday: 14:00-16:00; Venue: 301**
**Tuesday: 14:00-16:00; Venue: 408**
**Course link: WAMPAC (uok.ac.ir)**

Spring 2024

## Outline

1. Self Introduction
2. Course information
3. Grading
4. Access to the courses
5. References
6. Projects vs homework vs pre-task




## Hassan Bevrani

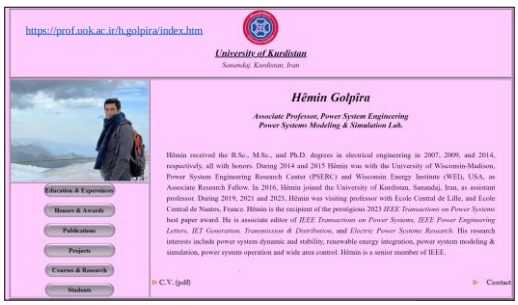
- Professor of Control Engineering
- PhD degree in electrical engineering from Osaka University, Osaka, Japan, in 2004
- Post-doctoral fellow, senior research fellow, visiting professor, and professor in several universities in Japan, Australia, France, and Germany
- Fellow member of IEEE
- Research interest: smart grids and microgrids control; applications of robust and intelligent control techniques
- Author/coauthor of 9 books, 15 book chapters, and over 450 papers
- Recipient of the prestigious 2023 IEEE Transactions on Power Systems best paper award.
- Associate editor for Journal of Modern Power Systems and Clean Energy

## Personal page


## Hêmin Golpîra

- Associate Professor of Power Systems
- PhD degree in electrical engineering from Tarbiat Modares University, Tehran, Iran, in 2014
- Associate research fellow in University of Wisconsin-Madison, USA
- Visiting professor in Ecole Central de Lille and Ecole Central de Nantes, France.
- Senior member of IEEE
- Research interest: Renewable-integrated Power System Stability and Control
- Recipient of the prestigious 2023 IEEE Transactions on Power Systems best paper award.
- Awarded 2022 IEEE Young Researcher Award;
- 3rd Ranked Award, 17th Kharazmi Youth Festival
- Associate editor for IEEE Transactions on Power Systems, IET Generation, Transmission and Distribution, and Electric Power Systems Research
- Author/coauthor of 1 book, and over 60 papers

## Personal page



## Course preview

**Defination** Stability, control, monitoring and protection

- Defining of the terms
- Case studies, benchmarks
- Integrated studies or pure studies?

**Category 2** Frequency

- Defining of frequency stability
- Control loops
- Dynamics of interest
- Protection

**Category 3** Voltage

- Defining of voltage stability
- Instability or collapse?
- Stability criteria
- Protection

**Category 4** Rotor angel

- Defining of small and transient stabilities
- Types of instability
- Control loops
- protection

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## Grading

| *Homework*/Pre-task | Final Exam | Project Reports and Presentation |
|---|---|---|
| • Participation: 20%<br>• Pre-task based on the IEEE taskforce report<br>• Homework defines during semester | • Participation: 30%<br>• Exam date: 12/04/1402 | • Participation: 50%<br>• Starts by defining appropriate benchmark<br>• During the course the project will be completed<br>• Report with simulation files<br>• Meeting in the end to present the results |

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## References


1- Hêmin Golpîra, Arturo Román-Messina, and Hassan Bevrani. *Renewable Integrated Power System Stability and Control*. Wiley-IEEE Press, 2021.

2- Bevrani, H., Watanabe, M., and Mitani, Y. *Power system monitoring and control*. Wiley-IEEE Press, 2014.

3- Hatziargyriou, N., Milanović, J., Rahmann, C., Ajjarapu, V., Cañizares, C., Erlich, I., ... & Vournas, C. (2020). Stability definitions and characterization of dynamic behavior in systems with high penetration of power electronic interfaced technologies. IEEE PES Technical Report PES-TR77.



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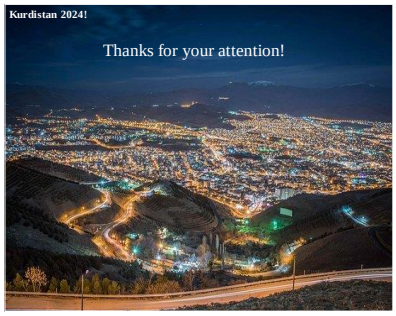
Kurdistan 2024!
Thanks for your attention!