## (B) Course information in english

**General course information:**

| | | | |
|---|---|---|---|
| **Course title:** | Wave mechanics and Offshore Structures | **Course code:** | ΥΔ1240 |
| **Credits:** | 6 | **Workload (hours):** | 164 |

| | | | | |
|---|---|---|---|---|
| **Course level:** | Undergraduate | ☑ | Graduate | ☐ |
| **Course type:** | Mandatory | ☐ | Selective | ☑ |
| **Course category:** | Basic | ☐ | Orientation | ☑ |

| | | | |
|---|---|---|---|
| **Semester:** | 9th | **Hours per week:** | 4 |

**Course objectives (capabilities pursued and learning results):**

Marine hydraulics and wave theory. Nonlinear waves. Unsteady and directional waves. Extreme waves and design wave. Stochastic analysis.
Wave loads on platforms and offshore structures.
Renewable Maritime Energy, Offshore wind farms, Wave energy

**Prerequisites:**

Fluid Mechanics and Wave Mechanics & Harbour Works

**Instructor's data:**

| | |
|---|---|
| **Name:** | Vanessa Katsardi |
| **Level:** | Assistant Professor |
| **Office:** | 113A |
| **Tel. – email:** | 24210 7 4167 – vkatsardi@civ.uth.gr |
| **Other tutors:** | - |

**Specific course information:**

| Week No. | Course contents | Hours | |
|---|---|---|---|
| | | Course attendance | Preparation |
| 1 | Introduction and presentation of the course | 4 | 0 |
| 2 | Linear Wave Theory | 4 | 3 |
| 3 | Wave kinematics | 4 | 3 |
| 4 | Wave forces – Morison equations | 4 | 3 |
| 5 | Loads on structures | 4 | 3 |
| 6 | Blue Energy – Offshore Wind Energy and Wave Energy | 4 | 3 |
| 7 | Real waves and predictions – SBM method | 4 | 3 |
| 8 | Nonlinear wave theories | 4 | 3 |
| 9 | Nonlinear wave solutions | 4 | 3 |
| 10 | Unsteady Waves | 4 | 3 |
| 11 | Directional Waves | 4 | 3 |
| 12 | Unsteady and Nonlinear Waves | 4 | 3 |
| 13 | Nonlinear and fully nonlinear wave models | 4 | 3 |
| 14 | Revision | 4 | 0 |

| Additional hours for: | | | |
|---|---|---|---|
| **Class project** | **Examinations** | **Preparation for examinations** | **Educational visit** |
| 56 | 0 | 0 | - |

**Suggested literature:**


- Χατζηγεωργίου, Ι., 2015. Δυναμική των αγωγών μεταφοράς ρευστών. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/505
- Κουτίτας, Κ., «Εισαγωγή στην Παράκτια Τεχνική και τα Λιμενικά Έργα», ISBN 960-431-289-8, Θεσσαλονίκη: Εκδόσεις Ζήτη, 1998
- Ματσούκης, Π.Φ., «Θαλάσσια Υδραυλική», ΔΠΘ, Ξάνθη, 1995
- Massel, S. R. "Ocean Surface Waves: Their physics and prediction", World Scientific, 1996
- Dean R.G. & Dalrymple R.A., "Water Wave Mechanics for Engineers and Scientistis", World Scientific, 1984
- Mei, C.C., "The applied Dynamics of Ocean Surface Waves", Advanced Series on Ocean Engineering - Volume 1, ISBN 9971-50-789-7, World Scientific, 1989
- Chatjigeorgiou, I. (2018). Analytical Methods in Marine Hydrodynamics. In Analytical Methods in Marine Hydrodynamics (p. I). Cambridge: Cambridge University Press


| **Teaching method** *(select and describe if necessary -* **weight***):* | | |
|---|---|---|
| Teaching | ☑ | 60% |
| Seminars | ☑ | 5% |
| Demonstrations | ☑ | 5% |
| Laboratory | ☐ | .....% |
| Exercises | ☑ | 30% |
| Visits at facilities | ☐ | .....% |
| Other *(describe):* …… | ☐ | .....% |
| Total | | 100% |

| **Evaluation method** *(select)*- **weight:** | | | | |
|---|---|---|---|---|
| | *written* | *%* | *Oral* | *%* |
| Homework | ☑ | 5% | ☑ | 5% |
| Class projects | ☑ | 66% + 33% | ☑ | Projects' examination |
| Interim examination | ☐ | | ☐ | |
| Final examinations | ☐ | - | ☐ | |
| Other *(describe):* …… | ☐ | | ☐ | |