View Syllabus Information

## Course Information

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| Year | 2021 | School | School of Creative Science and Engineering | | |
| Course Title | Hydraulics B<br>IPSE Course | | | | |
| Instructor | ESTEBAN, Miguel | | | | |
| Term/Day/Period | spring semester Wed.3 | | | | |
| Category | Elective Compulsory Subjects | Eligible Year | 2nd year and above | Credits | 2 |
| Classroom | 52-104 | Campus | Nishi-Waseda(Former: Okubo) | | |
| Course Key | 27GD032009 | Course Class Code | 01 | | |
| Main Language | English | | | | |
| Class Modality Categories | Hybrid (In-person/Online) | | | | |
| Course Code | CSTX25ZL | | | | |
| First Academic disciplines | Civil Engineering | | | | |
| Second Academic disciplines | Civil Engineering | | | | |
| Third Academic disciplines | Hydaulic Engineering | | | | |
| Level | Intermediate, developmental and applicative | Types of lesson | Lecture | | |

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Latest Update : 2021/02/01 19:37:18

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| Subtitle | Application of Hydrodynamics to Civil and Environmental Engineering |
| Course Outline | Note: The eligible year for EBSE September enrollees is different from the above. Please make sure to check “Students HANDBOOK”.<br><br>Fundamental equations in the field of hydraulics, and its application to civil and environmental engineering will be explained<br>The main targets are pipe flows (e.g. flows in drainage channel) and open channel flows (e.g. river flow). |
| Objectives | 1) You can explain about major basic technical terms in hydraulics.<br>2) You can explain about energy losses in pipe flow.<br>3) You can solve application problems of siphon.<br>4) You can solve application problems of hydraulic jumps and hydraulic bores in open channel hydraulics.<br>5) You can qualitatively draw surface profiles of non-uniform flow in the vicinity of dams and gates. |
| before/after course of study | After the class, please read your own note again and try to understand the topics/equations/practice problems explained in the class. |
| Course Schedule | 1: Basic Equations<br>Three basic conservation laws in hydraulics, and fundamental equations (e.g. Euler equations, Navier-Stokes equations) will be explained.<br>2: Basic Equations for Pipe Flow<br>Basic Equations for Pipe Flow<br>3: Turbulence in Pipe Flow<br>Turbulence in Pipe Flow<br>4: Energy Losses in Pipe Flow<br>Energy Losses in Pipe Flow<br>5: Network of Pipe Flows 1<br>Network of Pipe Flows<br>Energy Grade Line, Siphon<br>6: Network of Pipe Flows 2<br>Network of Pipe Flows<br>Pump & Turbine, Pipe flow analysis<br>7: Open Channnel Flow - Supercritical flow and Subcritical flow<br>Open Channnel Flow<br>- Supercritical flow and Subcritical flow<br>8: Hydraulic Jump and Hydraulic Bore<br>Hydraulic Jump and Hydraulic Bore<br>9: Calculation of Uniform Flow<br>Calculation of Uniform Flow<br>10: Basic Equations for Non-uniform Flow<br>Basic Equations for Non-uniform Flow<br>11: Surface Profile of Non-Uniform Flow<br>Surface Profile of Non-Uniform Flow<br>12: Calculation of Non-Uniform Flow<br>Calculation of Non-Uniform Flow<br>13: Unsteady Flow in Open Channel<br>Unsteady Flow in Open Channel<br>14: Similitude Law, Sediment Transport in River, Underground Water Flow, Summary of Hydraulics<br>Similitude Law<br>Underground Water Flow<br>Sediment Transport in River<br>Summary of this course will also be provided.<br>15: Final Examination<br>Final examination will be held in the last week of the course (Week 15) |
| Textbooks | Handouts will be distributed in the class. |
| Reference | Useful materials (textbooks or papers) will be introduced during the class. |
| Evaluation | Rate: Exam: 100% — Evaluation Criteria: Final Examination 60% |
| Note / URL | |