

Hydraulics 1: Course notes

Staff

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Course Outline

Hydraulics I

- A Fluid properties*
 - A1 Introduction: Fluids, continuum and density
 - A2 Viscosity, surface tension and pressure
 - A3 Tutorial: fluid properties
- B Hydrostatics*
 - B1 Hydrostatic pressure and the hydrostatic equation
 - B2 Pressure measurement
 - B3 Hydrostatic force on a plane surface
 - B4 Buoyancy and Archimedes Principle
 - B5 Hydrostatic force on a curved surface
 - B6 Tutorial: Hydrostatics
- C Kinematics and continuity*
 - C1 Kinematics
 - C2 Conservation of mass: continuity
 - C3 Tutorial: Kinematics and continuity
- D Energy and momentum: Principles*
 - D1 Conservation of energy: Bernoulli's Equation
 - D2 Bernoulli's Equation: Applications to flow measurement
 - D3 Momentum principle: control volumes
 - D4 Momentum principle: open channel flow
 - D5 Tutorial: forces and hydraulic jumps
- E Pipeflow*
 - E1 Reynolds Experiment: Laminar and turbulent flow
 - E2 Pipeflow: laminar flow
 - E3 Flow from static reservoir (no energy losses)
 - E4 Turbulent flow and head loss
 - E5 Pipeflow: other head losses
 - E6 Tutorial: Pipeflow
- F Energy and momentum: further applications*
 - F1 Sharp expansions and orifice meters
 - F2 Momentum principle: effects of gravity
 - F3 Tutorial: Gravity and flow measurement

Assessment

Coursework (laboratory work and problems):		
	Fluid properties and hydrostatics	5%
	Momentum and energy	5%
	Pipeflow network design project	10%
Exam:	Four out of six questions (free choice)	80%

Books

Massey DS (revised Ward-Smith), *Mechanics of Fluids*. 532
Chadwick AJ and Morfett JC (and Borthwick M, for later editions), *Hydraulics in Civil and Environmental Engineering*. 627
Hamill L, *Understanding Hydraulics*. 627
White FM, *Fluid Mechanics*. 532
Douglas JF and Matthew RD, *Solving Problems in Fluid Mechanics*. 532
Featherstone RE and Nalluri, *Civil Engineering Hydraulics*. 627

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David Kirk



Hydraulics 1 Course Notes Personalpagesnchester:

Mining and Metallurgy ,1929 Contains abstracts of professional and technical papers **Classed Subject Catalog**
Engineering Societies Library,1963 The Builder ,1893 **Engineering** ,1897 Engineering Record, Building Record
and Sanitary Engineer ,1883 **The Engineer** ,1894 **Engineering News-record** ,1911 **The Cultivator & Country**
Gentleman ,1884 **Chemical & Metallurgical Engineering** ,1920 **Educational Times** ,1919 *Educational Times*
and Journal of the College of Preceptors ,1920 *The Educational Times, and Journal of the College of Preceptors* ,1919
The Commercial and Financial Chronicle ,1914 The American Gas Light Journal ,1896 Practical Engineer ,1904
Machinery and Production Engineering ,1927 *Electrical World* ,1893 **The Illustrated Carpenter and Builder**
,1885 *The Iron Age* ,1907 **Frank Leslie's Illustrated Newspaper** ,1871

Hydraulics 1 Course Notes Personalpagesnchester: Bestsellers in 2023 The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous compelling novels enthralling the hearts of readers worldwide. Lets delve into the realm of bestselling books, exploring the captivating narratives that have captivated audiences this year. Hydraulics 1 Course Notes Personalpagesnchester : Colleen Hoovers "It Ends with Us" This poignant tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover masterfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can triumph. Hydraulics 1 Course Notes Personalpagesnchester : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids captivating storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Hydraulics 1 Course Notes Personalpagesnchester : Delia Owens "Where the Crawdads Sing" This mesmerizing coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, captivating readers with its evocative prose and mesmerizing setting. These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered. The novel begins with Richard Pape, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a masterful and gripping novel that will keep you wondering until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

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The End of the Affair, set in London during and just after World War II, is the story of a flourishing love affair between Maurice Bendrix and Sarah Miles. The End of the Affair (1955) In WW2 London, a writer falls in love with the wife of a British civil servant but both men suspect her of infidelity with yet another man. The End of the Affair eBook : Greene, Graham: Kindle Store The book is an excellent psychological study of Sarah and her life changing decisions and their effect on Bendrix, Henry and another important character, Smythe ... No 71 - The End of the Affair by Graham Greene (1951) Jan 26, 2015 — Graham Greene's moving tale of adultery and its aftermath ties together several vital strands in his work, writes Robert McCrum. The End of the Affair | Graham Greene, 1955, Catholic faith The novel is set in wartime London. The narrator, Maurice Bendrix, a bitter, sardonic novelist, has a five-year affair with a married woman, Sarah Miles. When a ... Graham Greene: The End of the Affair The pivotal moment of Graham Greene's novel The End of the Affair (1951) occurs in June 1944 when a new form of weapon strikes home: the V-1, the flying ... The End of the Affair Based on a novel by Graham Greene, this is a romantic drama set during World War II that is in many ways a standard love triangle involving a guy, his best ... Convince Them in 90 Seconds or Less: Make Instant ... But he doesn't stop there. This book shows how to turn those instant connections into long-lasting, productive business relationships."—Marty Edelston, ... Convince Them in 90 Seconds or Less: Make Instant ... Convince Them in 90 Seconds or Less: Make Instant Connections That Pay Off in Business and in Life · Paperback · \$13.95. Convince Them in 90 Seconds or Less This book teaches you about the snap judgments that are made in those first few instants and how you can make them work to your advantage. Once you're past ... How to Persuade People in 90 Seconds or Less May 27, 2010 — "Just adjust to useful attitudes, as opposed to useless attitudes," he says. "Useful might be resourceful or welcoming, enthusiastic. Useless ... Convince Them in 90 Seconds Mar 11, 2021 — There are a number of rules to learn in order to establish a fruitful relationship. They are to make the other person talk, stay focused on what ... Book review: Convince them in 90 seconds Aug 31, 2010 — Successful leaders share three really useful attitudes. They're enthusiastic. They're curious. And they embrace humility, with a public persona ... Convince Them in 90 Seconds or Less Quotes It's much easier to be convincing if you care about your topic. Figure out what's important to you about your message and speak from the heart. Convince Them in 90 Seconds or Less: Make Instant ... May 26, 2010 — Convince Them in 90 Seconds or Less: Make Instant Connections That Pay Off in Business and in Life (Paperback). By Nicholas Boothman. \$13.95. Convince Them in 90 Seconds or Less: Make Instant ... May 26, 2010 — Whether you're selling, negotiating, interviewing, networking, or leading a team, success depends on convincing other people - and ... Dopefiend by Goines, Donald Dopefiend is his classic descent into the junkie's harrowing nightmare... Teddy finally got the girl of his dreams. Together, Teddy and Terry filled people with ... Dopefiend by Donald Goines Dopefiend is about two young people, Terry and Teddy, who get warped into the dope fiend life style. Teddy was already addicted when he met Terry. Their ... Dopefiend Dopefiend: The Story of a Black Junkie is a 1971 novel by Donald Goines and his first published novel. ... The book is

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