Second year Engineering

ILOs: Apply the mathematical formulation of the basic laws governing laminar fluid flow kinematics and dynamics and be able to discuss the assumptions that underlie them (criteria 1, 3); Apply dimensional analysis to given engineering situations, and apply dynamic similarity laws to scale models and full size components (criterion 1); Describe fluid flow around engineering shapes, including the phenomena of boundary layers and wakes, and calculate their lift and drag characteristics (criteria 2, 3)

CLOs: Numerous CLOs refer to teamwork and communication skills (criterion 4)

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| Criteria | HD | DN | CR | PP | NN |
| Demonstrate and apply theoretical and practical knowledge of Fluid Mechanics and related engineering principles to design a marine vehicle(30%) | Demonstrate and apply *comprehensive* knowledge of maritime fluid mechanics and hydrostatics when *thoroughly discussing and describing* the *main* concepts and features related to the design.Make *meaningful assumptions* and *correctly calculate all* of the expected parameters and variables, *thoroughly justifying* their use and outcomes.S*upport all* your work with *extensive, relevant and current* literature, *link all* of your design and development work to *relevant* fluid mechanics theory and maritime industry practices. | Demonstrate and apply *broad* knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing* the *main* concepts and features related to the design.Make *relevant assumptions* and *correctly calculate* the expected parameters and variables, *justifying* their use and outcomes.*Support* your work with *relevant* and *current* literature, *link most* of your design and development work to *relevant* fluid mechanics theory and maritime industry practices | Demonstrate and apply knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing* *most* of the concepts and features related to the design.Make *assumptions* and *calculate most* expected parameters and variables, *justifying* their use and outcomes.*Support most of* your work with *relevant* literature, *link some of* your design and development work to *relevant* fluid mechanics theory and maritime industry practices. | Demonstrate and apply *basic* knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing* *some* of the concepts and features related to the design.Make at least *half the* *required assumptions* and *calculate some* of theexpected parameters and variables, partially *justifying* their use and outcomes.*Support* at least *half* of your work with literature, *link some* ofyour design and development work tofluid mechanics theory and maritime industry practices. | Demonstrate *partially-developed* knowledge of fluid mechanics and hydrostatic, and *state* concepts and *describe* features related to the design.Make *insufficient or wrong* assumptions and *partially* calculate *some* of the expected parameters, o*ccasionally* *justifying* their use and outcomes.*Partially link* to *some* fluid mechanics and engineering practices. |
| Solve problems in the construction and testing phases of the marine vehicle (30%)   | Communicate and work *effectively* in a team and as a leader to *efficiently* plan and conduct the project to achieve *all* stipulated goals.Solve problems in the construction & testing phases to:* provide *accurate*, *innovative and practica*l solutions,
* devise a *detailed* and *correct* testing schedule and conduct *correct, complete, and safe* testing of the vehicle, and
* *successfully* develop a *working* marine vehicle that *meets all* and *exceeds some* operational specifications.
 | Communicate and work *effectively* in a team and as a leader to plan and conduct the project to achieve *all* stipulated goals.Solve problems in the construction & testing phases to:* provide accurate and practical solutions most of which are innovative,
* devise a correct testing schedule and conduct correct, mostly complete, and safe testing of the vehicle, and
* successfully develop a working marine vehicle that meets all operational specifications.
 | Communicate and work in a team and *occasionally* as a leader to plan and conduct the project to achieve *most* of the stipulated goals.Solve problems in the construction & testing phases to:* provide accurate and practical solutions,
* devise a testing schedule and conduct correct and safe testing of the vehicle, and
* successfully develop a working marine vehicle that meets most of the operational specifications.
 | Communicate and work *regularly* in a team to plan and conduct the project to achieve the *some* stipulated goals.Solve problems in the construction & testing phases to:* provide some accurate and practical solutions,
* devise a testing schedule and conduct safe testing of the vehicle and at least half of this is correct, and
* develop a partially working marine vehicle that meets at least half of the operational specifications.
 | Work *mainly* as an *individual.**Partially solve problems* in the construction & testing phases to:* provide inaccurate and/or incomplete solutions,
* conduct incorrect, unsafe and incomplete testing, and
* develop a vehicle that meets a few of the operational specifications.
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| Analyse results to justify assessment of marine vehicle’s performance (20%) | Thoroughly and methodically analyse data/results by:* comparing all of the predicted and actual performance of the vehicle to accurately assess how well it meets the operational specifications
* clearly justifying your judgments by referring to relevant and current literature, theory and calculations.
 | Methodically analyse data/results by:* comparing most of the predicted and actual performance of the vehicle to accurately assess how well it meets the operational specifications
* justifying your judgments by referring to relevant and current literature, theory and calculations.
 | Analyse data/results by:* comparing most of the predicted and actual performance of the vehicle to accurately assess, for the most part, how well it meets the operational specifications
* justifying most of your judgments by referring to partly relevant literature, theory and calculations.
 | Analyse data/results by:* comparing at least half of the predicted and actual performance of the vehicle to assess how well it meets the operational specifications
* justifying at least half your judgments by referring to some literature, theory and calculations.
 | Analyse some data/results. |
| Communicate in a team in writing in the form of a technical report(20%) | Communicate *concisely* and *coherently* in a *structured* and *readable* report that adheres to the *given format.*Include *comprehensive*, *fully* *detailed, and correct sketches* and *CAD* *drawings* that *make it easy* to comprehend the construction and layout of the vehicle.Present data in a format that is *easily* *interpreted* because it:* is *neat*, *clearly, and accurately sorted and labelled*
* *uses clear, concise and accurate legend*s and *units*
 | Communicate *concisely* and *coherently* in a *structured* and *readable* report that adheres to the *given format.*Include *detailed* *and correct sketches* and *CAD* *drawings* that *make it easy* to comprehend the construction and layout of the vehicle.Present data in a format that is *easily* *interpreted* because it:* is neat, clearly and accurately sorted and labelled
* uses clear, concise and accurate legends and units
 | Communicate *coherently* in a *structured* and *readable* report that adheres to the given format.Include *correct sketches and CAD drawings* that *assist* in comprehending the construction and layout of the vehicle.Present data in a format that can be *interpreted* because it:* is *clearly and accurately sorted and labelled*
* *uses clear and accurate legend*s and *units*
 | Communicate in a *structured and readable* report that *largely* adheres to the given format.Include *sketches* and *CAD drawings* that *assist* in comprehending *most* of the construction and layout of the vehicle.Present data in a format that can be *interpreted* because it:* is sorted and labelled
* uses accurate legends and units
 | Present information. |