

Outline Design Report (weighted 40% towards the final subject grade) (Group assessment)

Criteria	Weighting	Mastery Level				
		F	D	C	B	A
Design rationale and justification (35 marks)						
Design criteria/requirements [critical thinking]		Does not attempt to or fails to identify and summarize the design criteria/requirements.	Summarizes the design criteria/requirements, though some aspects are incorrect or confused and key issues are neglected or glossed over.	Presents an adequate summary of the design criteria/requirements but tends to be at a superficial level.	Shows some understanding of the different aspects of the design criteria/requirements.	Identifies the key design criteria/requirements
Safety, health and comfort analysis [written communication]		No attempts to consider the safety, health and comfort issues.	The analysis demonstrates poor understanding of the safety, health and comfort issues and potential constraints to the building development.	The analysis demonstrates limited understanding of the safety, health and comfort issues and potential constraints to the building development.	The analysis demonstrates good understanding of the safety, health and comfort issues and potential constraints to the building development.	The analysis is thorough and demonstrates well understanding of the safety, health and comfort issues and potential constraints to the building development.
Generation of systems [creative thinking]		Only one system is generated with no alternatives.	A few design alternatives are generated.	A number of design alternatives are generated, but with little diversity.	A good number of distinct design alternatives are generated.	An extensive range of distinct design alternatives are generated.
Rationale and justification for systems selection [critical thinking]*		Only the final design solutions are provided.	Inappropriate analyses are selected and/or major procedural and conceptual errors are made in deciding which systems best meet the needs and criteria.	Appropriate analyses are selected but analyses include some procedural errors in deciding which systems best meet the needs and criteria.	Appropriate analyses are selected but analyses include some minor procedural errors in deciding which systems best meet the needs and criteria.	Each alternative is appropriately and correctly analyzed for technical feasibility to decide which systems best meet the needs and criteria.
Load estimation (25 marks)						
Systems load calculation		Fails to provide any estimation of system loading of the main services.	Uses incorrect methods of and data for systems load estimation or the calculation contains many significant errors.	Uses correct methods of and data for systems load estimation but the calculation contains a few major errors.	Uses correct methods of and data for systems load estimation. The calculation contains a few minor errors.	Uses correct methods of and data for systems load estimation. The calculation is accurate.
Major plants sizing		Fails to provide any plants sizing load estimation.	Uses incorrect methods and data to calculate the loads of plant sizing or the calculation contains many significant errors.	Uses correct methods and data to calculate the loads of plant sizing but the calculation contains a few major errors.	Uses correct methods and data to calculate the loads of plant sizing. The calculation contains a few minor errors.	Uses correct methods and data to calculate the loads of plant sizing. The calculation is accurate.

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Budget estimation		Fails to provide any budget estimation for the building services systems and provisions.	Uses incorrect methods of estimation for the building services systems. No provisions are made and/or the calculation contains many significant errors.	Uses correct methods of estimation for the building services systems and provisions but some key factors are overlooked and/or the calculation contains some a few major errors.	Uses correct methods of estimation for the building services systems and provisions. Most key factors have been taken into account but the calculation contains a few minor errors.	Uses correct methods of estimation for the building services systems and provisions. All key factors have been taken into account. The calculation is accurate.
Quality of schematic diagrams (30 marks)						
Space utilization		Insufficient thought has been given to the usage and layout of the spaces.	The usage and layout of the spaces suit only part of the client's wants, with some key issues and/or constraints being overlooked.	Satisfactory usage of the spaces and the design suits the client's wants, but some minor issues and/or constraints are overlooked. The layout of the plant room is appropriately presented.	Good usage of the spaces and the design suits the client's wants, but with one or two gaps in meeting the business, structural, mechanical and electrical requirements. The layout of the plant room is appropriately presented.	Maximise the usage of the spaces with thorough design that fits client's want as well as the business, structural, mechanical and electrical requirements. Clearly presents the layout of the plant room.
Services distribution and coordination		Insufficient thought has been given to the main vertical and horizontal services distribution and coordination.	The distribution and coordination of the main vertical and horizontal services are adequate, but with some key issues and/or constraints being overlooked.	The distribution and coordination of the main vertical and horizontal services are acceptable, but some minor issues and/or constraints are overlooked.	The distribution and coordination of the main vertical and horizontal services are suitable, but with one or two gaps in meeting the business, structural, mechanical and electrical requirements.	The distribution and coordination of the main vertical and horizontal services are designed in a thorough way that fit the business, structural, mechanical and electrical requirements.
Drawings		None of the geometry in the drawing is continuous. Drawings provided are not sufficient, correct and appropriate. All drawings are not to the appropriate scale and dimensioning.	Some geometry in the drawing is continuous. Drawings views provided are incorrect/inappropriate. Some drawings are not to the appropriate scale and dimensioning.	Most geometry in the drawing is continuous. Drawings views provided are sufficient and most are correct and appropriate. Drawing is to the appropriate scale and dimensioning.	Almost all geometry in the drawing is continuous. Drawings views provided are sufficient, correct and appropriate. Drawing is to the appropriate scale and dimensioning.	All geometry in the drawing is continuous. Drawing views provided are sufficient, correct and appropriate. Drawing is to the appropriate scale and dimensioning.
Report writing skills (10 marks)						
Grammar and spelling [written communication]		Written English so poor as to be barely understandable. Many technical mistakes.	Frequent problems with sentence construction. Frequent grammar, punctuation, and spelling errors.	Written style wordy or repetitive, but sentence construction generally correct. Some grammar, punctuation and spelling errors.	Written style is generally clear and readable. Grammar, punctuation and spelling are mostly correct.	Written report is clear and readable, with conventions of grammar, punctuation and spelling adhered to consistently.

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Structure and development [written communication]		No evidence of planned structure. No sense of balance or emphasis given to ideas according to their importance.	Structure and plan only vaguely evident. Often inappropriate balance or emphasis given to ideas according to their importance.	Majority of the content relevant to the topic but significant issues not covered.	Assignment follows logical sequence. Demonstrates effective use of proportion and emphasis.	Assignment follows clear, logical sequence. Highly effective use of proportion and emphasis.

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Integrated System Design Report (weighted 40% towards the final subject grade) (Individual assessment)

Criteria	Weighting	Mastery Level				
		F	D	C	B	A
Design constraints and criteria, and any major changes from the outline design stage (25 %)						
Design constraints [critical thinking]		Does not attempt to or fails to identify and summarize the regulatory/ utility/ site/ client constraints.	Summarizes the regulatory/ utility/ site/ client constraints, though some aspects are incorrect or confused and key issues are neglected or glossed over.	Presents an adequate summary of the regulatory/ utility/ site/ client constraints but tends to be at a superficial level.	Shows some understanding of the different aspects of the regulatory/ utility/ site/ client constraints.	Identifies the key regulatory/ utility/ site/ client constraints.
Design intent and criteria [critical thinking]		Does not attempt to or fails to identify and summarize the design intent and criteria.	Summarizes the design intent and criteria, though some aspects are incorrect or confused and key issues are neglected or glossed over.	Presents an adequate summary of the design intent and criteria but tends to be at a superficial level.	Shows some understanding of the different aspects of the design intent and criteria.	Identifies the key design intent and criteria.
Major changes from the outline design report [critical thinking]		Does not attempt to or fails to identify and summarize the major changes from the outline design report.	Summarizes the major changes from the outline design report, though some aspects are incorrect or confused and key issues are neglected or glossed over.	Presents an adequate summary of the major changes from the outline design report but tends to be at a superficial level.	Shows some understanding of the different aspects of the major changes from the outline design report.	Identifies the major changes from the outline design report.
Justification for detailed services design, supported by calculation/software simulation (25 %)						
Description of the detail design and the service system		Description of the detail design and the service system is inadequate.	The detail design and the service system are listed but cannot be followed easily, or not aligned with the proposed theme and business objectives.	The detail design and the service system are explained adequately but there are some gaps or unclear descriptions.	The detail design and the service system are explained well, but with one or two gaps.	The detail design and the service system are explained clearly enough to be replicable.
System performance and life-cycle costing of design options		Fails to provide any simulation of system performance and life-cycle costing of design options.	Uses correct methods of and data for simulation of system performance and life-cycle costing of design options but the simulation contains many major errors.	Uses correct methods of and data for simulation of system performance and life-cycle costing of design options. The simulation contains a few major errors.	Uses correct methods of and data for simulation of system performance and life-cycle costing of design options. The simulation contains a few minor errors.	Uses correct methods of and data for simulation of system performance and life-cycle costing of design options. The simulation is accurate.
Interpretation of simulation output on system performance [problem solving]		No interpretation of the simulation output to address the case.	Provides an inadequate interpretation of the simulation output and does not derive a logical	Provides an adequate interpretation of the simulation output and solves the case.	Provides a logical interpretation of the simulation output and solves the case.	Provides a clear and logical interpretation of the simulation output and solves the case at a

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Rationale and justification for selected services design [critical thinking]		Only the final design solutions are provided.	Inappropriate analyses are selected and/or major procedural and conceptual errors are made in deciding which services design best meet the intent and criteria.	Appropriate analyses are selected but analyses include some procedural and conceptual errors in deciding which services design best meet the intent and criteria.	Appropriate analyses are selected but analyses include some minor procedural errors in deciding which services design best meet the intent and criteria.	Each alternative is appropriately and correctly analyzed for technical feasibility to decide which services design best meet the intent and criteria.
Systems coordination and integration		Student demonstrates no effort to coordinate and integrate the service systems.	Limited efforts to coordinate and integrate the service systems.	Satisfactory work to coordinate and integrate the service systems.	Good coordination and integration among services systems.	Excellent coordination and integration among services systems.
System operation and control, project programme, and combined services drawing (25 %)						
Description of system operation and control		Description of system operation and control is inadequate.	The system operation and control are listed but cannot be followed easily, or not aligned with the proposed theme and business objectives.	The system operation and control are explained adequately but there are some gaps or unclear descriptions on how the system should be operated to achieve the desired performance and how it is controlled to operate in accordance with the design intent.	The system operation and control are explained well, but with one or two gaps on how the system should be operated to achieve the desired performance and how it is controlled to operate in accordance with the design intent.	The system operation and control are explained clearly enough to be replicable, clearly shows how the system should be operated to achieve the desired performance and how it is controlled to operate in accordance with the design intent.
Project programme [problem solving]		No coherent programme plan for the design, installation, testing and commissioning of the services systems is formulated	Develops a marginal programme plan for the design, installation, testing and commissioning of the services systems that is difficult to follow.	Develops an adequate programme plan for the design, installation, testing and commissioning of the services systems. Some key factors/issues are overlooked.	Develops an appropriate programme plan for the design, installation, testing and commissioning of the services systems. Most key factors/issues have been taken into account.	Develops a clear and comprehensive programme plan for the design, installation, testing and commissioning of the services systems. All key factors/issues have been taken into account.
Estimation of energy costs for the systems operation		Fails to provide any estimation of the electricity, water, gas and oil costs for operating the systems.	Uses correct methods of and data for estimation of the electricity, water, gas and oil costs for operating the systems but the estimation is unreasonable and contains many	Uses correct methods of and data for estimation of the electricity, water, gas and oil costs for operating the systems. The estimation is generally reasonable and contains a	Uses correct methods of and data for estimation of the electricity, water, gas and oil costs for operating the systems. The estimation is mostly reasonable and contains a	Uses correct methods of and data for estimation of the electricity, water, gas and oil costs for operating the systems. The estimation is reasonable and accurate.

Department of Building Services Engineering
Assessment Rubrics for BSE3712

Criteria	Weighting	Mastery Level				
		F	D	C	B	A
Combined services drawings with sectional views for congested areas		Drawings provided are not sufficient, correct and appropriate. All drawings are not to the appropriate scale and dimensioning.	Drawings views provided are not sufficient and some are incorrect or inappropriate. Some drawings are not to the appropriate scale and dimensioning.	Drawings views provided are sufficient and most are correct and appropriate. Drawings are to the appropriate scale and dimensioning.	Drawings views provided are sufficient, correct and appropriate. Drawings are to the appropriate scale and dimensioning	Drawings views provided are significantly sufficient, correct and appropriate. Drawings are to the appropriate scale and dimensioning.
Detailed design drawings including schematics and layouts (15%)						
Quality of the following drawings - - Detail design drawings of the selected design theme - System schematic drawings - Three different trades of services layouts for one of the three representative floors - Schematic diagrams of system operation and control		Drawings provided are not sufficient, correct and appropriate. All drawings are not to the appropriate scale and dimensioning.	Drawings views provided are not sufficient and some are incorrect/inappropriate. Some drawings are not to the appropriate scale and dimensioning.	Drawings views provided are sufficient and most are correct and appropriate. Drawing is to the appropriate scale and dimensioning.	Drawings views provided are sufficient, correct and appropriate. Drawing is to the appropriate scale and dimensioning	Drawings views provided are significantly sufficient, correct and appropriate. Drawing is to the appropriate scale and dimensioning.
Report writing skills (10%)						
Use of English [written communication]		Written English so poor as to be barely understandable. Many technical mistakes.	Frequent problems with sentence construction. Frequent grammar, punctuation, and spelling errors.	Written style wordy or repetitive, but sentence construction generally correct. Some grammar, punctuation and spelling errors.	Written style is generally clear and readable. Grammar, punctuation and spelling are mostly correct.	Written report is clear and readable, with conventions of grammar, punctuation and spelling adhered to consistently.
Structure and development [written communication]		No evidence of planned structure. No sense of balance or emphasis given to ideas according to their importance.	Structure and plan only vaguely evident. Often inappropriate balance or emphasis given to ideas according to their importance.	Majority of the content relevant to the design theme but some significant issues not covered.	Design report follows logical sequence. Demonstrates effective use of proportion and emphasis.	Design report follows clear, logical sequence. Highly effective use of proportion and emphasis.

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Design Progress (weighted 10% towards the final subject grade) (Individual assessment)

Criteria	Weighting	Mastery Level				
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Planning and progress of design tasks (40 marks)						
Planning of design tasks [problem solving]*		No coherent plan is developed to carry out the design tasks	Develops a marginal plan that is difficult to follow. Unable to make adjustments as needs/ difficulties arise.	Develops an adequate plan. Sometimes able to make adjustments as needs/ difficulties arise.	Student develops an appropriate plan and is able to adjust the plan as needs/ difficulties arise.	Student develops a clear and comprehensive plan and shows outstanding ability to modify plan as needs/ difficulties arise.
Progress management		Fails to follow the plan and meet the milestone dates of the design tasks.	Requires extensive supervision in order to follow the plan throughout the project. Completion of the design tasks always fall behind their milestone dates.	Requires some supervision in order to follow the plan throughout the project. Completion of some of the design tasks fall behind their milestone dates.	Able to follow the plan throughout the project with minimal supervision, only a few design tasks fall behind their milestone dates.	Able to follow the plan throughout the project with minimal supervision. Demonstrates considerable efforts to review the progress continuously. All the design tasks are completed adhere to their milestone dates.
Communication and coordination among design team members (30 marks)						
Working and communicating with other team members		Frequently works outside the team environment, leading to irregular and undependable progress toward project milestones. Communication with other team members is minimal.	Works in part as an individual. Little communication with other team members or does not listen to others' views with respect. Demonstrates little efforts in meeting project and reporting milestones.	Works collaboratively most of the time. Maintains good communication with other team members. Demonstrates acceptable efforts in meeting project milestones and supporting team activities.	An active team member who works and communicates well with others. Demonstrates considerable efforts in meeting project milestones and supporting team activities.	A constructive team member who works and communicates effectively with others to help the team move forward. Puts a great deal of efforts in meeting project milestones and supporting team activities.
Coordination of work with other team members		Does not perform any duties of assigned team role and do not contribute knowledge or skills to share with the team. Relied on others to do the work.	Performs a few duties of assigned team role and contribute a small amount of knowledge and skills to share with the team. Completed some of the assigned work.	Performs some of the duties of assigned team role and contributes knowledge and skills to share with the team. Completed some of the assigned work.	Performs most of the duties of assigned team role and contributes knowledge and skills to share with the team. Completed most of the assigned work.	Performs all the duties of assigned team role and contributes knowledge and skills to share with the team. Completed all the assigned work.

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Response to comments/questions of Design Tutor and record of meeting discussions (30 marks)						
Response to comments		Does not attempt to make any modifications to the design work in response to comments made.	Modifications made to the design works do not correspond to comments made.	Occasionally able to make appropriate and corresponding modifications to the design work in response to comments made.	Able to make appropriate and corresponding modifications to the design work in response to comments made most of the time.	Always able to make appropriate and corresponding modifications to the design work in response to comments made.
Question handling at meetings		Unable to answer any questions appropriately - confused and limited.	Only responds to some questions and does not appear to have sufficient grasp of the subject to demonstrate confidence or thought.	Can answer simple, straight-forward questions with reasonable confidence and thought, but cannot handle more difficult or complex questions.	Responds to questions with quite a high level of confidence and careful thought but does not respond well to questions to which answer is not known.	Responds to questions with confidence and careful thought and handles situations where the answer is not known appropriately.
Record of meeting discussions		Student fails to maintain a design file and record of meeting discussions.	Student maintains a design file and record of meeting discussions but information is incomplete, disorganized and includes many irrelevant materials.	Student maintains a complete design file and record of meeting discussions, but information is not well organized and includes some irrelevant materials	Student maintains a complete design file and record of meeting discussions and presents it in an orderly manner, but includes a few irrelevant materials.	Student maintains a complete design file and record of meeting discussions and presents it in a clear, concise and orderly manner. There are no irrelevant materials.

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Oral Presentation (weighted 10% towards the final subject grade) (Individual assessment)

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Technical competence (40 marks)						
Subject knowledge on system design [oral communication]		Student does not have grasp of information.	Student is uncomfortable with information and is able to give only rudimentary explanations.	Student is at ease with basic information, but has only a basic understanding of knowledge.	Student demonstrates a very good grasp of knowledge.	Student demonstrates an excellent grasp of knowledge with explanations and elaboration.
Coordination and integration		Student demonstrates no coordination effort in project management and is not able to integrate the subject knowledge.	Limited efforts in coordination work for project management as well as integration of the subject knowledge.	Satisfactory coordination work for project management as well as integration of the subject knowledge.	Good coordination work for project management as well as integration of the subject knowledge.	Excellent coordination work for project management as well as integration of the subject knowledge.
Presentation (40 marks)						
Organization [oral communication]		Audience cannot understand presentation because there is no sequence of information.	Audience has difficulty following presentation because student's sequence jumps around.	Student presents information in a reasonably logical sequence and audience is able to follow most of the ideas presented.	Student presents information in a mostly logical sequence which audience can follow.	Student presents information in logical, interesting sequence which audience can easily follow.
Presentation skills [oral communication]		Student mumbles and speaks too quietly. It is difficult for the audience members to hear the presentation.	Student's voice is low. Audience members have some difficulty hearing presentation.	Student's voice is acceptable clear. Audience members have a few difficulties hearing presentation.	Student's voice is clear. Audience members can hear presentation.	Student uses a clear and loud voice so that all audience members can hear presentation clearly.
Time control		No sense of timing.	Generally covers most aspects but either finish too early or does not allow enough time to finish.	Generally follows a timing plan, but places inappropriate emphasis on some components.	Student has a good timing plan and generally follows it, but is slightly over or under schedule.	The presentation has been planned carefully and a suitable balance of time is allocated to each section.
Question & answer (20 marks)						
Team work		No evidence of teamwork and division of tasks.	Little evidence of teamwork and/or very uneven distribution of work. The student does not do his/her part of the work.	Some evidence of teamwork and division of tasks but with individual focus only. The student does not participate as much as others in the presentation.	Adequate evidence of teamwork and a fairly good division of tasks, with team members understand each other's role. The student participates fully in the presentation as the others.	Clear evidence of teamwork and an equitable division of tasks, with team members understand each other's role. The student participates fully and equally in the presentation as the others.

Department of Building Services Engineering
Assessment Rubrics for BSE3712

Criteria	Weighting	Mastery Level				
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Accuracy of answer		Fails to accurately understand questions being posed or provides unacceptable amount of incorrect or inaccurate answers.	Accurately understand questions being posed, but provides many incorrect or inaccurate answers.	Accurately understand questions being posed and provides sufficiently correct and accurate answers but includes some major mistakes.	Accurately understand questions being posed and provides correct and accurate answers but includes a few minor mistakes.	Handles questions thoughtfully and assertively with correct, accurate and verified answers.
English proficiency		Poor English with many grammatical, syntactic and phonological errors that often impede the overall meaning. Always pronounces terms incorrectly. Vocalized pauses (e.g. "ah, um") are used in abundance.	Some grammatical, syntactic and phonological errors that sometimes impede the overall meaning. Many key terms are incorrectly pronounced. Vocalized pauses are used frequently.	Minimal grammatical, syntactic and phonological errors that do not impede the overall meaning. Pronounces some key terms incorrectly. Vocalized pauses detract from the fluidity of the presentation.	Proficient English approaching comparability to that of native speaker. Pronounces most terms correctly. Some vocalized pauses are used.	Highly proficient English comparable to a native speaker. Correct pronunciation of terms. No excessive use of vocalized pauses.
Gesture and manner		Student is excessively nervous. Fails to make any eye contact with the audience. No gestures to engage the audience.	Student displays some nervousness. Minimal eye contact with the audience and gestures to engage the audience.	Student displays mild nervousness. Establish some eye contact with the audience. Some gestures are used to keep the audience's attention.	Student displays confidence. Appropriate eye contact with the audience. Appropriate gestures that enhance articulation.	Student projects a high level of confidence. Eye contact is effectively established with the audience. Successfully reinforce articulation through effective use of appropriate gestures.

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