MATH2269 Applied Bayesian Statistics Rubric for the Final Project

* Note that multipliers for each rating (Not acceptable, Needs improvement, etc.) are given as intervals. So, the marker can rate your report within the given interval.

Criteria	Not acceptable (0)	Needs Improvement (0-2]	Under expectation (2-4]	Pass (4-6]	Meets expectation (6-7]	Creates Distinction (7-8]	Creates High Distinction (8-10]
Prepare a precise and and accurate academic report (25%)	The report is written in an informal language OR not explaining the results with proper visualisations and tables that include informative figure/table numbers and titles OR the statistical language is used inaccurately or incorrectly.	The report is written in a formal language. But there are some irrelevant outputs such as software warning or error messages OR there are some unnecessary outputs presenting information that does not contribute to the solution/analysis OR there are some figures/tables without figure/table numbers and informative titles OR there are some outputs not commented on OR some comments on the outputs are incorrect OR there are **minor** inaccuracies in the statistical language used in the report OR there are English language and formatting issues.	The report is written in a formal language AND there is no irrelevant output in the report. But there are some figures/tables without figure/table numbers and informative titles OR there are some unnecessary outputs presenting information that does not contribute to the solution/analysis OR there are some outputs not commented on OR some comments on the outputs are incorrect OR there are **minor** inaccuracies in the statistical language used in the report OR there are **minor** English language and formatting issues.	The report is written in a formal language AND there is no irrelevant output in the report AND there is no unnecessary output; hence, every single output in the report contributes to the solution. But there are some figures/tables without figure/table numbers and informative titles OR there are some outputs not commented on OR some comments on the outputs are incorrect OR there are **minor** inaccuracies in the statistical language used in the report OR there are **minor** English language and formatting issues.	The report is written in a formal language AND there is no irrelevant output in the report AND there is no unnecessary output; hence, every single output in the report contributes to the solution AND every single table/figure has a figure/table number and an informative title. But there are some outputs not commented on OR some comments on the outputs have minor errors OR there are minor inaccuracies in the statistical language used in the report OR there are minor English language and formatting issues.	The report is written in a formal language AND there is no irrelevant output in the report AND there is no unnecessary output; hence, every single output in the report contributes to the solution AND every single table/figure has a figure/table number and an informative title AND a technically sound (correct) comment made on each presented output. But there are minor inaccuracies in the statistical language used in the report OR there are minor English language and formatting issues.	The report is written in a formal language AND there is no irrelevant output in the report AND there is no unnecessary output; hence, every single output in the report contributes to the solution AND every single table/figure has a figure/table number and an informative title AND a technically sound (correct) comment made on each presented output AND there is no inaccuracy in the statistical language used in the report AND there is no English language and formatting issues.
Give an informative presentation that demonstrates your results with a right content and precise structure (5%)	Does not hold attention of audience. Speaks in a monotonous tone. Unsuccessful in presenting the purpose and subject in a precise way. Some conclusions are not supported with enough evidence. Does not present the purpose and subject. Does not support conclusions with enough evidence. Unable to complete presentation within the allocated time frame.	Holds the attention of the audience for some parts of the presentation. But, unsuccessful in presenting the purpose and subject in a precise way OR does not present the purpose and subject OR does not support conclusions with enough evidence OR unable to complete presentation within the allocated time frame.	Holds the attention of the audience for some parts of the presentation. Successful in presenting the purpose and subject in a precise way. But, does not present the purpose and subject OR does not support conclusions with enough evidence OR unable to complete presentation within the allocated time frame.	Holds the attention of the audience for some parts of the presentation. Successful in presenting the purpose and subject in a precise way. Presents the purpose and subject clearly. But, does not speak with fluctuation in volume to maintain audience interest OR does not support conclusions with enough evidence OR unable to complete presentation within the allocated time frame.	Holds the attention of the audience for some parts of the presentation. Successful in presenting the purpose and subject in a precise way. Presents the purpose and subject clearly. Supports conclusions with enough evidence. But, does not speak with fluctuation in volume to maintain audience interest OR unable to complete presentation within the allocated time frame.	Holds the attention of the audience for some parts of the presentation. Successful in presenting the purpose and subject in a precise way. Presents the purpose and subject clearly. Supports conclusions with enough evidence. Completes the presentation within the allocated time frame. But, does not speak with fluctuation in volume to maintain audience interest.	Holds attention of entire audience. Speaks with fluctuation in volume to maintain audience interest. Presents the purpose and subject clearly and supports conclusions with enough evidence within the allocated time frame.
Quality of problem of interest and data (5%). For example, estimation of succes probability of a coin flipping is a very basic problem. It is used as a toy example to explain the contents in the course. However, estimation of the success probability of a COVD-19 treatment is a significant problem although it uses the same mathodology.	Problem solved with the analysis of data is not described OR the estimation problem is a very basic problem.	The problem solved with the analysis of data is roughly described OR dataset/problem includes a basic aspects of the Bayesian analysis and a solution with classical statistics can straightforwardly be found.	Problem solved with the analysis of data is roughly described at some degree to highlight its practical importance AND dataset/problem is partly suitable to demonstrate some degree of understanding of Bayesian analysis.	Problem solved with the analysis of data is described to highlight its practical importance AND dataset/problem is partly suitable to demonstrate some degree of understanding of Bayesian analysis.	Problem solved with the analysis of data is described to highlight its practical importance AND dataset/problem is suitable to demonstrate some degree of understanding of Bayesian analysis.	Problem solved with the analysis of data is described to highlight its practical importance AND dataset/problem is suitable to demonstrate a good understanding of Bayesian analysis.	Problem solved with the analysis of data is described in a very clear way to highlight its practical importance AND dataset/problem is suitable to use sophisticated models to demonstrate an excellent understanding of Bayesian modelling.
Use the right R codes provided by the courseware and demonstrate your competency by improving upon them (10%)	Some of the scripts to run analyses are generating error messages OR irrelevant scripts are used OR it is unclear what does each line do in the R codes. Suitable object names are not used to make it easy to follow the code. Suitable title, axes-labels, and legends are not added on the plots by the codes. There is no effort to improve upon the given codes in the courseware.	All scripts to run analyses are relevant and working properly. However, it is hard to follow codes to identify what each line does OR suitable object names are not used to make it easy to follow the code OR suitable title, axes-labels, and legends are not added on the plots by the codes OR there is no effort to improve upon the given codes in the courseware.	All scripts to run analyses are relevant working properly AND suitable explanations are given on the codes. But, suitable object names are not used to make it easy to follow the code OR suitable title, axes-labels, and legends are not added on the plots by the codes OR there is no effort to improve upon the given codes in the courseware.	Scripts to run analyses are relevant and working properly AND suitable explanations are given on the code AND suitable object names are used to make it easy to follow the code. But , suitable title, axes-labels, and legends are not added on the plots by the codes OR there is no effort to improve upon the given codes in the courseware.	Scripts to run analyses are relevant and working properly AND suitable explanations are given on the code AND suitable object names are used to make it easy to follow the code AND suitable title, axes-labels, and legends are added on the plots by the codes. But, there is no effort to improve upon the given codes in the courseware.	Scripts to run analyses are relevant and working properly AND suitable explanations are given on the code AND suitable object names are used to make it easy to follow the code AND suitable title, axes-labels, and legends are added on the plots by the codes AND there is some effort to improve the given codes AND for example, the script is arranged in a way not to repeat the same code chunks.	Scripts to run analyses are working properly and suitable explanations are given on the code AND suitable object names are used to make it easy to follow the code AND suitable title, axes-labels, and legends are added on the plots by the codes AND the scripts include user-created functions (other than those given by the textbook) to implement all analyses without using the same code chunks repeatedly.
Specify suitable prior distributions and specify appropriate values for the parameters of prior distributions (20%)	At least one of the prior distributions does not match with the domain of the corresponding parameter. For example, a gamma prior is induced on a parameter showing success probability.	All the prior distributions match with the domain of the corresponding parameter. But, both mean and variance of the prior distribution do not reflect the prior information and the degree of belief in the prior.	All the prior distributions match to the domain of the corresponding parameter. But, both mean and variance of the prior distribution do not reflect the prior information and the degree of belief in the prior OR suitable explanations on the prior knowledge and the degree of belief in it are not given.	All the prior distributions match with the domain of the corresponding parameter AND suitable explanations on the prior knowledge and the degree of belief in it are given AND but, **both** mean **and** variance of the prior distribution do not reflect the prior information and the degree of belief in the prior.	All the prior distributions match with the domain of the corresponding parameter AND suitable explanations on the prior knowledge and the degree of belief in it are given AND but, **either** mean **or** variance of the prior distribution does not reflect the prior information and the degree of belief in the prior.	All the prior distributions match with the domain of the corresponding parameter AND suitable explanations on the prior knowledge and the degree of belief in it are given AND both mean and variance of the prior distribution reflect the prior information and the degree of belief in the prior in a suitable way. But, different prior distributions or parameter values have not been considered to assess the sensitivity of results to the prior distributions.	All the prior distributions match with the domain of the corresponding parameter AND suitable explanations on the prior knowledge and the degree of belief in it are given AND both mean and variance of the prior distribution reflect the prior information and the degree of belief in the prior in a suitable way AND suitable priors are specified for model selection AND different prior distributions or parameter values have been considered to assess the sensitivity of results to the prior distributions.
Apply the Bayes theorem - Prepare a suitable JAGS model daigram and reflect it on the model text for JAGS implementation (%20)	No model diagram is provided OR no model text is provided OR model cannot be implemented by JAGS.	A model diagram and the corresponding model text is provided. But, both the model diagram and the model text have errors in terms of representation of any of the random variables, likelihood or prior distributions; hence, JAGS implements a wrong model.	A model diagram and the corresponding model text is provided. But, either the model diagram or the model text has an error in terms of representation of any of the random variables, likelihood or prior distributions; hence, JAGS implements a wrong model.	A model diagram and the corresponding model text is provided AND the model text is correct. But, the model diagram does not match with the model text in terms of representation of any of the random variables, likelihood or prior distributions. There is at least one symbol used incorrectly in the model diagram.	A model diagram and the corresponding model text is provided AND although JAGS implements the correct model with the correct model text, the model diagram has just one minor error in terms of representation of any of the random variables, likelihood or prior distributions.	A model diagram and the corresponding model text is provided AND JAGS implements the correct model AND the model diagram shows the correct model with no errors.	A model diagram and the corresponding model text is provided AND JAGS implements the correct model and the model diagram shows the correct model with no errors AND model selection is considered and implemented correctly AND in the model diagram and the corresponding model text, there are some attempts to improve the model to run the MCMC faster and these attempts are clearly articulated in the report.
Apply the Bayes theorem -Conduct a comprehensive diagnostic checking to validate the assumtions of the fitted models (15%)	There is no effort for diagnostic checking to validate the representativeness and accuracy of the generated chains.	**Some** of the tools/statistics/measures covered in the course for diagnostic checking are applied or interpreted in terms of any of the representativeness or accuracy. But, some of the tools/statistics/measures are left without any interpretation OR either of burn-in, number of chains or thinning is not suitable OR the comments made on the tools/statistics/measures are wrong/insufficient.	**Some** of the tools/statistics/measures covered in the course for diagnostic checking are applied or interpreted in terms of both of the representativeness and accuracy AND burn-in, number of chains and thinning are suitable. But, some of the tools/statistics/measures are left without any interpretation OR the selection of burn-in, number of chains and thinning values are not explained clearly OR the comments made on the tools/statistics/measures are wrong/insufficient.	**Some** of the tools/statistics/measures covered in the course for diagnostic checking are applied or interpreted in terms of both of the representativeness and accuracy AND burn-in, number of chains and thinning are suitable AND the selection of burn-in, number of chains and thinning values are explained clearly. But, some of the tools/statistics/measures are left without any interpretation OR the comments made on the tools/statistics/measures are wrong/insufficient.	**All** of the tools/statistics/measures covered in the course for diagnostic checking are applied and interpreted correctly in terms of both of the representativeness and accuracy AND burn-in, number of chains and thinning are suitable AND the selection of burn-in, number of chains and thinning values are explained clearly. But, the comments made on the tools/statistics/measures are wrong/insufficient.	**All** of the tools/statistics/measures covered in the course for diagnostic checking are applied and interpreted correctly in terms of both of the representativeness and accuracy AND burn-in, number of chains and thinning are suitable AND the selection of burn-in, number of chains and thinning values are explained clearly AND some comments made on the efficiency of the implemented MCM method AND there is no wrong/insufficient comment made on the tools/statistics/measures.	**All** the tools/statistics/measures covered in the course for diagnostic checking are applied and **both** representativeness and accuracy of the generated chains are validated AND the comments made on the results are **all** correct and suitable AND the results are articulated in a way to demonstrate a good understanding of diagnostic checking AND the efficiency of the implemented MCMC method is improved by suitable adjustments in burn-in, number of chains and thinning AND the reason behind doing the adjustments are explained clearly.