MEMORIAL UNIVERSITY OF NEWFOUNDLAND

FACULTY OF ENGINEERING AND APPLIED SCIENCE

Engineering: 5434 —— Applied Mathematical Analysis

COMPARISON OF DIFFERENT METHODS FOR NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS :

Method	*Type/ Estimation*	*Local Error*	*Global Error*	*Function Evaluations per Step*	*Ease of Step Size Change*	*Recom-mended*
Euler	Single Step, Initial Value	$O(h^2)$	$O(h)$	1	Good	No
Modified Euler	Single Step, Arithmetic Average of initial and predicted slopes	$O(h^3)$	$O(h^2)$	2	Good	No
Runge-Kutta (4th Order)	Single Step, Weighted average of four values	$O(h^5)$	$O(h^4)$	4	Good	Yes
Runge-Kutta-Felberg	Single Step, Weighted average of six values	$O(h^6)$	$O(h^5)$	6	Good	Yes
Adams-Moulton	Multi Step, Requires another method to start off the solution	$O(h^5)$	$O(h^4)$	2	Poor	Yes