



NUMERICAL METHOD

MATH-2140

1st term 1439-1440

Instructor: Dr. Phillips Agboola

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Module Description

1. Topics to be covered		
Topics	No of Weeks	Contact hours
Number Representation and base Number, Error, Sources of Errors	1	3
Nonlinear equations, Simple and Multiple roots of nonlinear equations, numerical methods for simple root (bisection, fixed-point, Newton's, scant) and multiple (modified) root Q1	2	6
Convergence of iterative methods for nonlinear equations, System of nonlinear equations (Newton's method) Q2	1	3
Linear systems, special matrices, direct methods (Gauss-elimination and its variants), for linear system, norms, iterative methods (Jacobi and Gauss-Seidel), error in linear systems	2	6
Approximating functions, polynomial interpolation (Lagrange and Newton's divided differences) formulas, error approximations ME	2	6
Numerical differentiations, approximation of first derivative of a function using numerical formulas (two-point and three-point), approximating second derivative of a function using three point formula Q3	2	6
Numerical integration, using closed Newton's cotes formula (Trapezoidal and Simpson's rules) Q4	2	6
Solution of ordinary differential equations by Taylor and Runge-Kutta method of order 2	2	6
Total number of weeks and contact hours per semester	14	42

Assessment:

1	Homework	Every Week	10%
2	Quizzes (4 quizzes)	Alternating	20%
3	Midterm Exam	After 7 th	25%
4	Class participation	Every w	5%
5	Final Exam	End of Semester	40%

Learning Resources

1. Required Text(s) <ul style="list-style-type: none">• Numerical Analysis By R.L.Burden, J.D.Faires (9th edition), Thomos Learning
2. Essential References Not Applicable

Course Policy

:General Rules

Course materials including lecture notes, presentations, assignments, etc. will be posted regularly on the <http://fac.ksu.edu.sa/pagboola>

In addition to the study material posted online and recommended textbook, the students are also required to consult the other suggested references/sources on a regular basis

Students are required to regularly check their University emails and the online Learning System (LMS) for course announcements and assignments

Use of mobile phones or other electronic devices is not allowed during class.-

Unless permitted by the instructor, all such electronic devices must be switched off or put on silence during class

Students are strongly encouraged to ask questions during lessons when prompted to do so by the instructor. If further clarification is needed, the students could consult the instructor during his assigned office hours

Where applicable, formulas will be provided in the exams. However, students are required to understand them, recognise their relevance and know how to apply them. Transparency, honesty and trustworthiness are expected to be upheld by both staff and students at all times

Attendance:

- Punctual attendance of all classes is crucial for achieving the objectives and learning outcomes of this course. The correlation between attendance and performance is well established.

- Attendance is compulsory for all classes including lectures, tutorials and laboratories.

- All students are required to arrive at least 5 minutes before the start of class.

Classes will start promptly on time.

- Any student who arrives after 10 minutes from the start of class will be considered absent.

-Any student whose overall attendance in a particular course is below 75% will not be allowed to sit the final exam for that course.

-Absence from tutorials will be included in the overall attendance record.