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|  | **Midterms Notes** | 9th July 2023 |

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**Each midterm is worth 30% of the course mark.**

**Syllabus:**

* Non-homogeneous ODE with constant coefficients
  + Method of undetermined coefficients
* Taylor series, Power series
* Laplace Transform

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**Non-homogeneous ODE with constant coefficients:**

One way to solve this type of ODE is method of undetermined coefficient.

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1. We solve the homogeneous ODE ( ); we call the solution .
2. We then find a particular solution of the non-homogeneous case .
3. The solution of non-homogeneous ODE is

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To find , we focus on . We have six cases:

1. is a polynomial.

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1. is trigonometric.

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1. is exponential.

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1. is multiplication of polynomial and exponential.

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1. is multiplication of trigonometric and exponential.

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1. is multiplication of trigonometric polynomial.

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This method fails for some problems.

If there is any duplication between homogeneous solution and your choice of then this method fails.

To fix this issue instead of we should consider . Now if and have any duplication then we should consider . So , , … continued till there’s no duplication.

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| Non-homogeneous ODE with constant coefficients | | |
| Method of undetermined coefficients | | |
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| 3 |  | In-Class |
| 4 |  | Homework |
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