

**INBOUND VIRTUAL MOBILITY PROGRAM  
FACULTY OF MECHANICAL AND MANUFACTURING ENGINEERING,  
UNIVERSITI TUN HUSSEIN ONN MALAYSIA  
PARIT RAJA, BATU PAHAT, JOHOR, MALAYSIA**

**Programme Name : Bachelor of Mechanical Engineering with Honours**

**Online Courses Offered:**

1. Creativity & Innovation
2. Computer Programming
3. Differential Equations
4. Fluid Mechanics I
5. Vibration
6. Manufacturing Technology

**BDA 10602 Creativity & Innovation**

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**Synopsis**

This course focuses on developing a creative person who will eventually think strategically, creatively and critically. The knowledge and skills acquired throughout the course will later be applied by the students in solving problems and making decisions in the future. In this course, students will be exposed to various creativity and problem solving techniques. Some of the skills to be covered throughout the course are problem solving, techniques in creativity and techniques in innovation.

**References**

1. Mumford, M.D. (2014). Leadership, Creativity and Innovation. Los Angeles: SAGE Reference. HD57.7.L442 2014
2. Bernacki, E. (2012). Wow! That's a Great Idea!. Singapore: Prentice Hall. HD53.B47 2002
3. De Bono, E. (2013). Serious Creativity 1: Lateral Thinking Tools, Techniques and Application, Allscript Books, Singapore. BF408.D366 2003
4. Harris, L.V.A. (2014). Idea Engineering: Creative Thinking and Innovation. New York: Momentum. T49.5.H37
5. Tidd, J. (2014). Open Innovation Research, Management and Practice. Singapore: World Scientific. T175.5.T52

**BDA 24202 Computer Programming**

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**Synopsis**

To give an introduction to programming concepts through the use of a high level programming language such as C. The programming language 'history and evolution'. Data types, input and output: operations and expressions. Programming Controls: while loop, for loop, if else and switch case. Structured programming and function.

**References**

1. Pal, M. (2013). C Programming: Including Numerical and Statistical Methods. Oxford: Alpha Science. QA76.7.P34 2013
2. McGrath, M. (2012). C Programming In Easy Steps, Warwickshire. QA76.73.M47 2012
3. Horton, I. (2011). Beginning C: From Novice To Professional, Berkeley, CA. QA76.73.C15.H67 2011
4. Ling, H.C. (2009). C Programming For Beginners. Kuala Lumpur: Prentice Hall. QA76.73.C15.C74 2009
5. Wahab, S.H. (2009). Asas Pengaturcaraan C Bagi Beginner. Selangor: Venton Publishing. QA76.73.C15.S92 2009
6. Prakash, S. (2015). Programming in C. New Delhi : I K International Pvt Ltd. QA76.73.C153 .P72 2015

7. Siegesmund, M. (2014). Embedded C Programming: Techniques and Applications of C and PIC MCUS. Oxford: Newnes. QA76.73.C15 .S54 2014
8. Langbridge, J. A. (2015). Arduino Sketches: Tools and Techniques for Programming Wizardry. Indianapolis, IN: John Wiley & Sons. TJ223.P76.L36 2015

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## **BDA 24303 Differential Equations**

### **Synopsis**

First Order Differential Equation: Formation. Methods of solution: separating the variables, homogeneous, linear and exact. Initial value problem. Applications: Newton's Law of cooling, linear motion. Second Order Linear Differential Equation with Constant Coefficients: Methods of solution: method of undetermined coefficients and method of variation of parameters. Applications in mechanical motions includes free oscillations and force oscillations. Laplace Transforms: Definition. Linearity. First shift theorem. Multiplying by t. Unit step functions. Delta functions. Second shift theorem. Inverse Laplace transform: Definition and its properties. Convolution theorem. Solve initial and boundary value problems for linear differential equations with constant coefficients which involve unit step functions, Dirac Delta functions and periodic functions. Fourier Series: Fourier series in interval  $(-l, l)$ . Odd and even functions. Half range Fourier series. Partial Differential Equation: Heat equations. Wave equations.

### **References**

1. Pal, Srimanta. (2015). Engineering Mathematics. Oxford Univ Press. TA330 .P35 2015
2. Bhattacharya, Subhamoy. (2015). Fundamentals of Engineering Mathematics. London: ICE Publishing. TA330 .B42 2015
3. Wirkus, Stephen, Allen. (2015). A Course in Ordinary Differential Equations. CRC Press, Taylor & Francis Group. QA372.W57 2015
4. Deng, Yuefan. (2015). Lectures, Problems and Solutions for Ordinary Differential Equations. World Scientific Publishing Co. Pte. Ltd. QA371 .D46 2015
5. Rehman, Hamood Ur. (2015). Partial Differential Equations and Mechanics., New York: Magnum Publishing. QA805.P37 2016
6. Bird, John. (2014). Engineering Mathematics. Routledge, London. TA330 .B57 2014

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## **BDA 20603 Fluid Mechanics I**

### **Synopsis**

This course will cover the Basic Principles of Fluid, Hydrostatic Pressure, Buoyancy and Effect of Vertical Acceleration on Fluid Static, Continuity Equations, Bernoulli Equation, Momentum Equation and Dimensional Analysis and Similarity.

### **References**

1. Yunus, A.C., & John, M.C. (2014). Fluid Mechanics Fundamentals and Applications, 3<sup>rd</sup> Edition, McGraw Hill. TA357.C46 2014.
2. Jog, C.S. (2015). Fluid Mechanics: Foundations and Applications of Mechanics, 3<sup>rd</sup> Edition, Cambridge University Press. QC145.2 .J64 2015
3. Bullet, Shaun. (2016). Fluid and Solid Mechanics. World Scientific Publishing Company. QA805 .F58 2016
4. Elger, Donald F. (2014). Engineering Fluid Mechanics. 10<sup>th</sup> Edition. New York: John Wiley. TA357 .E53 2014
5. Sabol, Stuart (2016). Case Studies in Mechanical Engineering: Decision Making, Thermodynamics, Fluid Mechanics and Heat Transfer. West Sussex Wiley. TJ148.S23 2016
6. Nakayama, Yasuki (2018). Introduction to Fluid Mechanics, 2<sup>nd</sup> Edition, Elsevier. Retrieved from: <https://app.knovel.com/web/toc.v/cid:kpIFME0012/viewerType:toc/>

## **BDA 31103 Vibration**

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### **Synopsis**

This course covers several topics in vibration and basic concept of sound. They are including fundamentals of vibration, free vibration, harmonically excited vibration, multi-degree-of-freedom vibration, determination of natural frequency and mode shapes, vibration control, vibration measurement and applications plus introduction to sound.

### **References**

1. Bies, D. A., & Hansen, C. H. (2018). Engineering Noise Control: Theory and Practice, 5th Edition. New York: Taylor and Francis. TD892. B53 2018
2. Blevins, R. D. (2015). Formulas for Dynamics, Acoustics and Vibration. Chinchester : John Wiley. TA332 .B53 2015
3. Tuma, J. (2014). Vehicle Gearbox Noise and Vibration. Hoboken : Wiley. TL262 .T85 2014
4. Munjal, M. L. (2013). Noise and Vibration Control. Singapore: World Scientific. TD892 .M86 2013
5. Kelly, S. G. (2012). Mechanical Vibrations: Theory and Applications, SI Edition, Cengage Learning. TA355. K444 2012
6. Rao, S. S. (2004). Mechanical Vibration, 5<sup>th</sup> Edition in SI Unit, Upper Saddle River. NJ: Pearson Education. TA355. R36 2004
7. Dukupati, R. V. (2010). Mechanical Vibrations. Oxford: Alpha Science. TA355. D844 2010
8. Gowda, T. (2012). Mechanical Vibrations. New Delhi: Tata McGraw Hill. TA355. G68 2012
9. Balachandran, B., & Magrab, E. B. (2009). Vibrations, 2<sup>nd</sup> Edition, Thomson Learning. TA355. B34 2009
10. Inman, D. J. (2008). Engineering Vibration, 3<sup>rd</sup> Edition, Upper Saddle River. NJ: Pearson Education. TA355. I55 2008
11. Ramamurti, V. (2008). Mechanical Vibration Practice and Noise Control. Oxford: Alpha Science. TA355. R35 2008
12. Ver, I. L. & Beranek, L. L. (2006). Noise and Vibration Control Engineering: Principles and Application, 2<sup>nd</sup> Edition. New Jersey: John Wiley. TD892. N65 2006

## **BDA 31403 Manufacturing Technology**

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### **Synopsis**

Introduction to production technology, Material characteristic and Selection of a materials, Metal machining process, Casting process, Metal forming process, Plastic manufacturing process, Powder metallurgy process, Joining processes.

### **References**

1. Kalpakjian, S. (2014). Manufacturing Engineering and Technology. Singapore: Pearson. TS176.K34 2014
2. Singh, D. K. (2014). Manufacturing Technology. New Delhi: Ane Books Pvt. Ltd. TA403 .S56 2014
3. Rao, P. N. (2013). Manufacturing Technology: Metal Cutting. New Delhi: Mc Graw Hill.
4. Rao, P. N. (2013). Manufacturing Technology V1, 4<sup>th</sup> ed., New Delhi: McGraw Hill Education.
5. Youssef, H.A. (2011). Manufacturing Technology: Materials, Processes, and Equipment. Boca Raton, FL: Taylor & Francis/CRC Press.
6. Yi, X. (2010). Materials and Manufacturing Technology. Stafa-Zuerich: Trans Tech. TA401.3.M3745 2010