Beginning Partial Differential Equations (Pure and Applied Mathematics: A Wiley Series of Texts, Monographs and Tracts)

By Peter V. O'Neil

Beginning Partial Differential Equations (Pure and Applied Mathematics: A Wiley Series of Texts, Monographs and Tracts) By Peter V. O'Neil

A broad introduction to PDEs with an emphasis on specialized topics and applications occurring in a variety of fields

Featuring a thoroughly revised presentation of topics, *Beginning Partial Differential Equations, Third Edition* provides a challenging, yet accessible, combination of techniques, applications, and introductory theory on the subjectof partial differential equations. The new edition offers nonstandard coverageon material including Burger's equation, the telegraph equation, damped wavemotion, and the use of characteristics to solve nonhomogeneous problems.

The *Third Edition* is organized around four themes: methods of solution for initial-boundary value problems; applications of partial differential equations; existence and properties of solutions; and the use of software to experiment with graphics and carry out computations. With a primary focus on wave and diffusion processes, *Beginning Partial Differential Equations, Third Edition* also includes:

- Proofs of theorems incorporated within the topical presentation, such as the existence of a solution for the Dirichlet problem
- The incorporation of Maple™ to perform computations and experiments
- Unusual applications, such as Poe's pendulum
- Advanced topical coverage of special functions, such as Bessel, Legendre polynomials, and spherical harmonics
- Fourier and Laplace transform techniques to solve important problems

Beginning of Partial Differential Equations, Third Edition is an ideal textbook for upper-undergraduate and first-year graduate-level courses in analysis and applied mathematics, science, and engineering.

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Editorial Review

Review

"I enjoyed perusing O'Neil's book. A beginner in the field of PDEs will learn quite a number of juicy facts concerning the flow of heat and the transmission of waves. While a next step will undoubtedly involve more rigor in the use of analytic tools, this first course will catch the attention of those with a curiosity for studying physical processes using differential equations." (*Mathematical Association of America*, 15 February 2015)

"This book is one of the textbooks that provide an introduction to basic methods and applications of partial differential equations for students of mathematics, physics and engineering." (*Zentralblatt MATH*, 1 October 2014)

From the Back Cover

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About the Author

PETER V. O'NEIL, PHD, is Professor Emeritus in the Department of Mathematics at the University of Alabama at Birmingham. He has over forty years of experience in teaching and writing and is the recipient of

the Lester R. Ford Award from the Mathematical Association of America. Dr. O'Neil is also a member of the American Mathematical Society, the Mathematical Association of America, the Society for Industrial and Applied Mathematics, and the American Association for the Advancement of Science.

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