

AQUACULTURE III

1. WEEK

Aquaculture Science and Aquaculture
Engineering

WEEKLY TOPICS

Week	Topics
1. Week	Aquaculture Science and Aquaculture Engineering
2. Week	Aquaculture: Economic and Environmental
3. Week	Aquaculture: Innovation and Social Transformation
4. Week	Aquaculture: Food Ethics
5. Week	Shellfish Aquaculture and the Environment
6. Week	Advances in aquaculture hatchery technology
7. Week	Recirculating Aquaculture
8. Week	Selection and Breeding Programs in Aquaculture
9. Week	Ecological and Genetic Implications of Aquaculture Activities
10. Week	Aquaculture: Biotechnology
11. Week	Aquaculture nutrition: gut health, probiotics, and prebiotics
12. Week	Mucosal Health in Aquaculture
13. Week	Off-Flavors in Aquaculture
14. Week	Sustainable Aquaculture Techniques



Aquaculture Science and Aquaculture Engineering

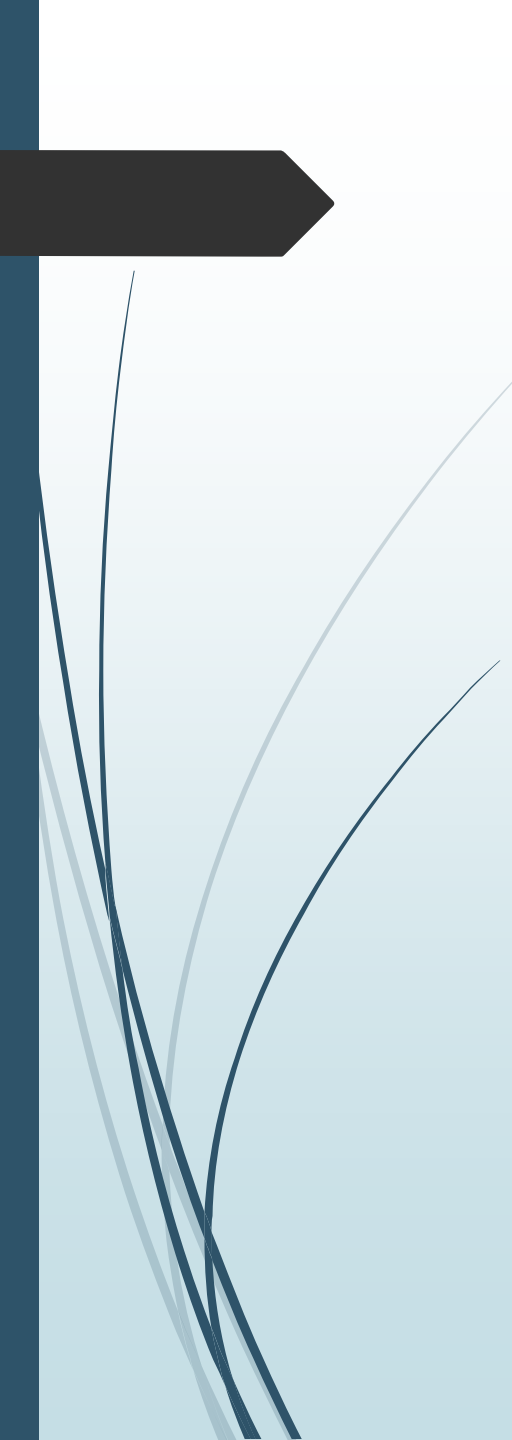
- ▶ Aquacultural engineering is a multidisciplinary field of engineering that aims to solve technical problems associated with farming aquatic vertebrates, invertebrates, and algae.
- ▶ Common aquaculture systems requiring optimization and engineering include sea cages, ponds, and recirculating systems.



Aquaculture Science and Aquaculture Engineering

- ▶ Aquaculture technicians, for instance, are involved in freshwater and marine farming, hatchery management and research into farmed species. They can be involved in research, equipment design, site development, and the harvesting, processing and shipment of products.


<https://www.jcu.edu.au/courses-and-study/courses/master-of-science-in-aquaculture-science-and-technology>



Aquaculture Science and Aquaculture Engineering

- ▶ The aquaculture industry has made remarkable progress in many countries most especially Southeast Asia (FAO, 1997), due largely to the contributions of aquaculture engineering.

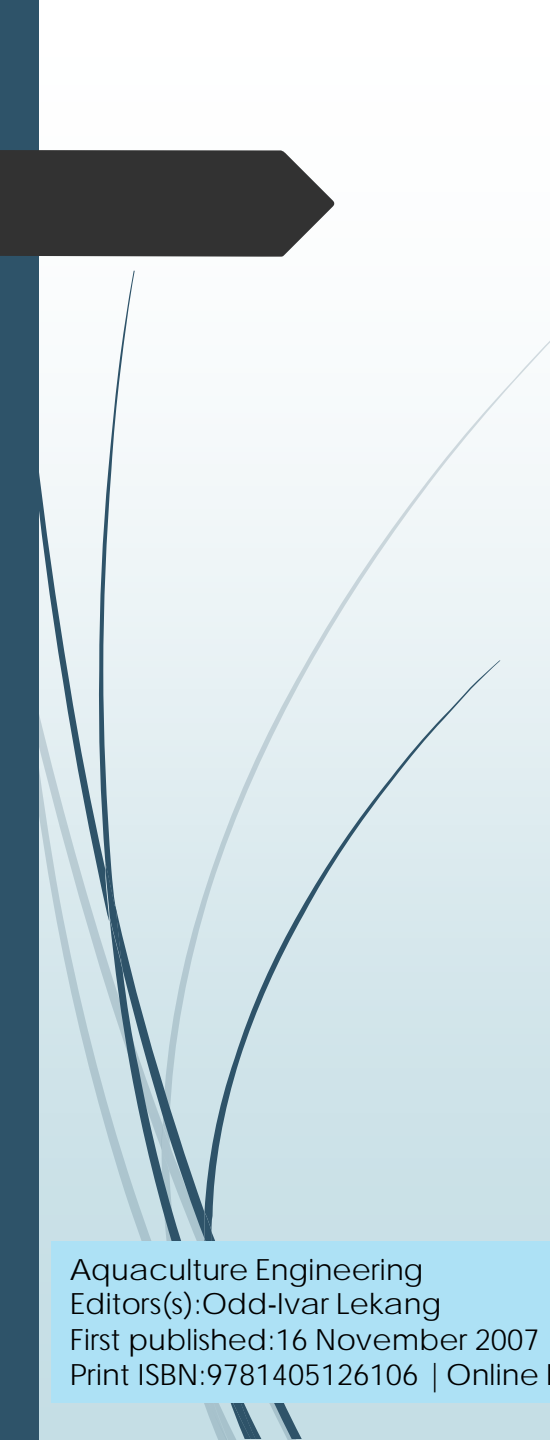
Uzukwu, P. U., George, O. S., & Jamabo, N. A. (2010). Aquaculture Engineering: Status and Roles in the Growth of Aquaculture Industry in Nigeria. *Current Research Journal of Biological Sciences*, 2(6), 410-413.



Aquaculture Science and Aquaculture Engineering

- ▶ **Aquaculture** is the **science** and **technology** of **producing aquatic plants** and **animals**.
- ▶ It is **not new**, but **has been practiced** in **certain Eastern cultures** for **over 2,000 years**.

Lawson, T. B. (Ed.). (2012). Fundamentals of aquacultural engineering. Springer Science & Business Media. <https://www.springer.com/gp/book/9781461275787#aboutBook>



Aquaculture Science and Aquaculture Engineering

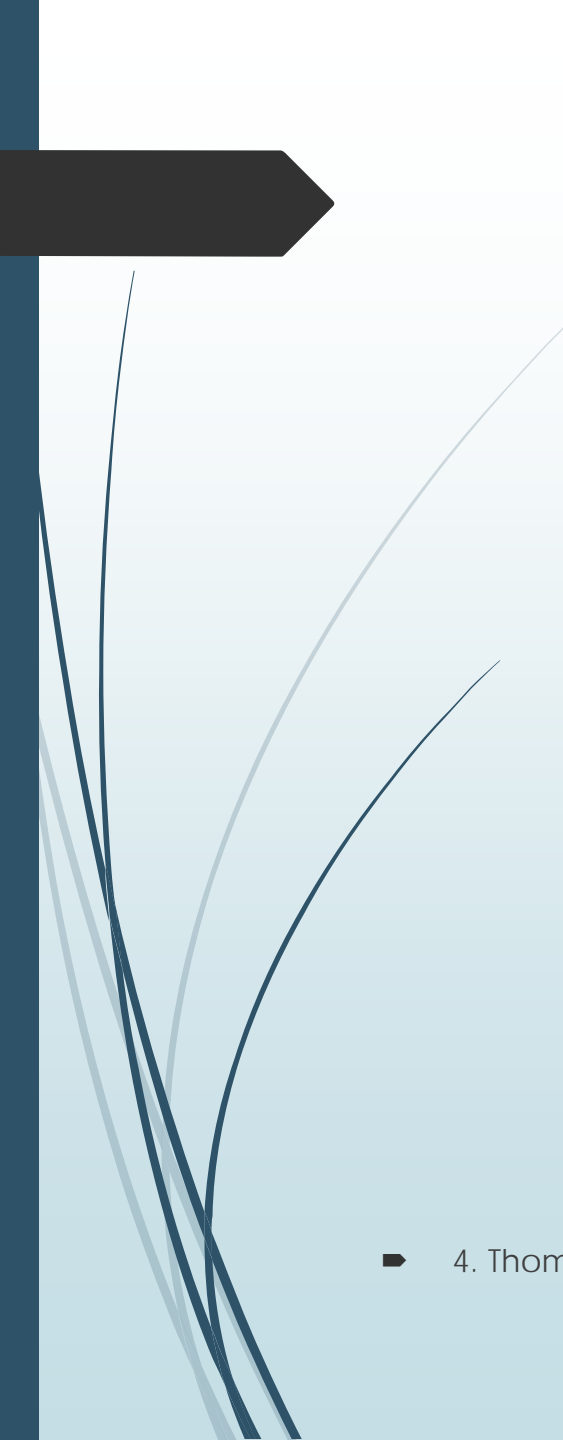
- ▶ As aquaculture continues to grow at a rapid pace, understanding the engineering behind aquatic production facilities is of increasing importance for all those working in the industry.
- ▶ Aquaculture engineering requires knowledge of the many general aspects of engineering such as material technology, building design and construction, mechanical engineering and environmental engineering
- ▶ Fish farmers and other personnel involved in the aquaculture industry, suppliers to the fish farming business and designers and manufacturers will find this book an invaluable resource. The book will be an important addition to the shelves of all libraries in universities and research institutions where aquaculture, agriculture and environmental sciences are studied and taught.



Aquaculture Science and Aquaculture Engineering

- ▶ Aquacultural engineering is a multidisciplinary field of engineering that aims to solve technical problems associated with farming aquatic vertebrates, invertebrates, and algae.[1]
- ▶ Common aquaculture systems requiring optimization and engineering include sea cages, ponds, and recirculating systems.[2]
- ▶ The design and management of these systems is based on their production goals and the economics of the farming operation.[3]

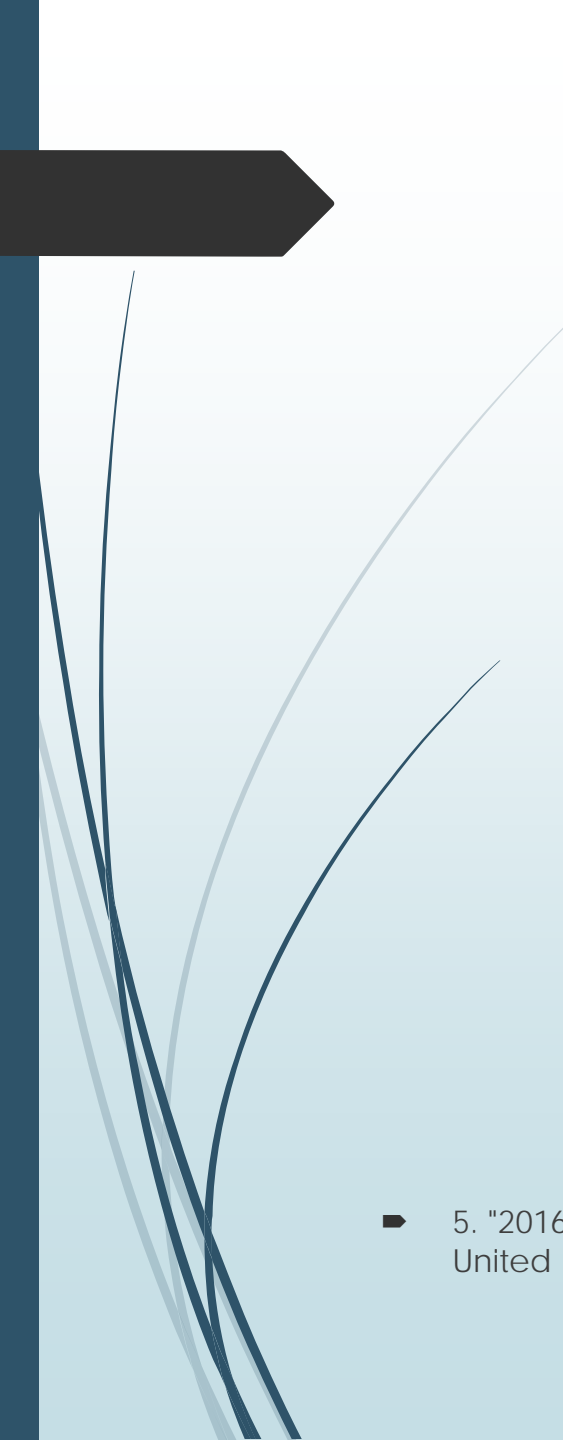
- ▶ 1. Frederick Wheaton (1933). Aquacultural Engineering. Kreiger Pub Co. ISBN 978-0-8946-4786-4.
- ▶ 2. Odd-Ivar Lekang (2013). Aquaculture Engineering (2nd ed.). John Wiley & Sons. p. 165. ISBN 978-0-470-67085-9.
- ▶ 3. Colt, John (1990). "The Role of Engineering Disciplines in Aquaculture". iChemE Symposium Series No. 111: 1–17.



Aquaculture Science and Aquaculture Engineering

- ▶ Aquaculture technology is varied with design and development requiring knowledge of mechanical, biological and environmental systems along with material engineering and instrumentation.[4]
- ▶ Furthermore, engineering techniques often involve solutions borrowed from wastewater treatment, fisheries, and traditional agriculture.

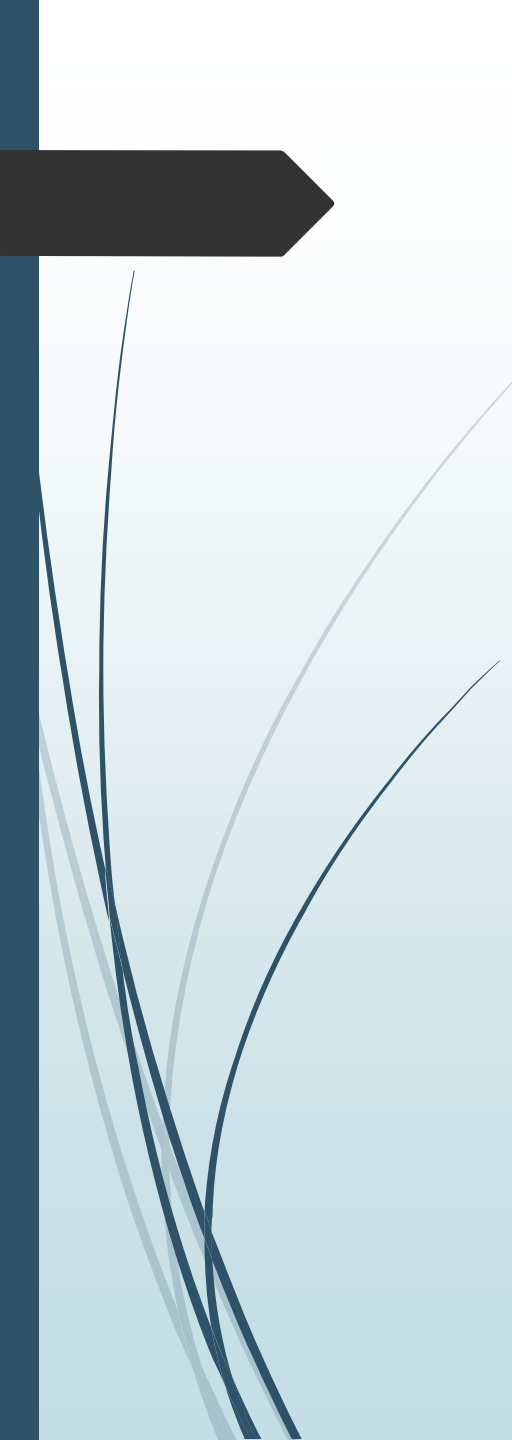
▶ 4. Thomas B. Lawson (1995). Fundamentals of Aquaculture Engineering. Springer US. ISBN 978-1-4615-7049-3.



Aquaculture Science and Aquaculture Engineering

- ▶ Aquacultural engineering has played a role in the expansion of the aquaculture industry, which now accounts for half of all seafood products consumed in the world.[5]
- ▶ To identify effective solutions the discipline is combined with both fish physiology and business economics knowledge.

▶ 5. "2016 The State of the Worlds Fisheries and Aquaculture" (PDF). Food and Agriculture Organization. Rome, Italy: United Nations. 2016. p. 77. ISBN 978-92-5-109185-2. Retrieved 2016-10-30.

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- References
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 - Aquaculture: An Introductory Text, 2005, Robert R. Stickney
 - Aquaculture Farming Aquatic Animals And Plants, 2012, John S. Lucas