Minnesota State College Southeast

BIKE 1040: History and Theory of Bike Design

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 1

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course will explore the evolution and developmental history of the bicycles from first invention concepts to modern day designs including electric assist bikes (E-bikes). Case studies will be conducted looking at commercially unique and engineering milestone bike designs in recent history (such as the rise of mountain biking, bike suspension, commuter bikes, gravel bikes, fat bikes, 26 plus, and e-bikes). Emphasis will be given to both practical facets of bicycle design, as well as artistic facets distinguishing similar bikes from one another. Lab work will include basic assembly, setup, adjustment and repair of modern bike building. (Prerequisite: none) (3 credits: 3 lecture/0 lab)

B. COURSE EFFECTIVE DATES: 02/27/2018 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Discussion on the evolution of modern bicycle designs and key developments
2. Identify important aesthetic design features of popular bicycles and review successful designs cases
3. Identify important mechanical components and key performance characteristics of modern bicycles
4. Discuss key differences between bike designs for specific applications (mountain, road, gravel, etc.)
5. Understand bicycle market history and modern sales trends
6. Understand how the advancement of materials affected bicycle design and evolution over time
7. Understand cost of components inherent in various bicycle designs
8. Discuss future trends of bicycle design and evolution
9. Lab work on bike assembly, adjustment, and repair

D. LEARNING OUTCOMES (General)

1. Knowledge of the historical development of bicycles and the evolution of modern designs
2. Fundamental understanding of key bicycle design principles
3. Understand the role that fit, finish, form and other industrial design elements play in bicycle design and how these can impact consumer decision making
4. Knowledge of how material availability and advancement has played a role in the evolution of bicycle designs and history
5. Understand how industrial design has played a role the commercial success of bikes
6. Understand the function of and readily identify the major mechanical components of common bicycle types and designs
7. Know why different components are utilized for different bicycle types
8. Understand how the performance of bicycles can be defined by design decisions such as component selection and frame geometry
9. Ability to differentiate different styles and types of bikes and their primary purpose
10. Understand the differing riding applications and expected rider experience
11. Knowledge of what features, trends, or other factors are currently driving or have historically driven the bicycle market
12. Ability to assemble a basic bill of material for a chosen bicycle type and demonstrate the trade-offs that component selection have on cost and perceived performance
13. Knowledge of emerging trends and technology around next generation bicycle designs
14. Ability to demonstrate how various bicycles are assembled and to make basic adjustments and repairs

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted