

1. G has a closed walk of an odd length iff G contains a cycle of an odd length.
2. Directed graphs. Definition. In-degree $d^+(u)$ and out-degree $d^-(u)$,
Lemma $\sum_{u \in V} d^+(u) = \sum_{u \in V} d^-(u) = |E|$.
3. Strongly connected components. Definition and examples.
4. Directed acyclic graph (DAG)
5. Theorem: the following conditions are equivalent for a directed graph
 - (a) each strongly connected component consists of exactly one vertex
 - (b) the graph is acyclic
 - (c) the vertices can be enumerated so that $(u, v) \in E$ only if $\#_u < \#_v$ (an edge goes only from a vertex with a smaller number to a vertex with a greater number).
6. Eulerian cycle. Criteria of existence.

References

The books are listed on the wiki-page.

[1]: Section 7.3

[3]: Sections 6.2

[4]: Sections 3.3.5

[7]: Chapter 10. (Definitions 4,5; Theorem 3) Chapter 11 (Definition 4)