Chapter 14 of *University Calculus*, Hass, Weir, Thomas

Below is a list of sections and subsections for Chapter 14. In the text, subsections are not numbered but each is set off by a title set in blue type. I've labeled the subsections, given the title, and indicated the page number in parenthesis. On the next page is a list of the subsections in the order we covered them in class.

14.1 Line Integral
   14.1.1 Definition and how to evaluate (851, unlabeled)
   14.1.2 Additivity (853)
   14.1.3 Mass and moment calculations (853)

14.2 Vector Fields, Work, Circulation, and Flux
   14.2.1 Vector fields (857)
   14.2.2 Gradient fields (859)
   14.2.3 Work done by a force over a curve in space (859)
   14.2.4 Flow integrals and circulation for velocity fields (862)
   14.2.5 Flux across a plane curve (863)

14.3 Path Independence, Potential Functions, and Conservative Fields
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   14.3.3 Line integrals in conservative fields (870)
   14.3.4 Finding potentials for conservative fields (872)
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14.4 Green’s Theorem in the Plane
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   14.4.2 Spin around an axis: the \( \hat{k} \)-component of curl (879)
   14.4.3 Two forms for Green’s Theorem (880)
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14.5 Surfaces and Area
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14.6 Surface Integrals and Flux
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   14.6.4 Moments and masses of thin shells (901)

14.7 Stokes’ Theorem
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   14.7.4 Proof of Stokes’ Theorem for polyhedral surfaces (910)
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14.8 The Divergence Theorem and a Unified Theory
   14.8.1 Divergence in three dimensions (914)
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   14.8.3 Proof of the Divergence Theorem
   14.8.4 Divergence Theorem for other regions
   14.8.5 Gauss’ Law
   14.8.6 Continuity equation of hydrodynamics
   14.8.6 Unifying the integral theorems
Reordering of Chapter 14 of *University Calculus*, Hass, Weir, Thomas

1. Line integrals for scalar fields
   14.1.1 Definition and how to evaluate (851, unlabeled)
   14.1.2 Additivity (853)
   14.1.3 Mass and moment calculations (853)

2. Surface integral for scalar functions
   14.5.1 Parametrizations of surfaces (887)
   14.5.2 Surface area (888)
   14.6.1 Surface integrals (896)

3. Vector fields
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4. Line integrals for vector fields
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   14.3.1 Path independence (868)
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5. Surface integrals for vector fields
   14.6.2 Orientation (899)
   14.6.3 Surface integral for flux (899)
   14.2.5 Flux across a plane curve (863)

6. Divergence and curl
   14.8.1 Divergence (878)
   14.8.2 Divergence in three dimensions (914)
   14.4.2 Spin around an axis: the $\hat{k}$-component of curl (879)
   14.7.1 Curl vector (905, unlabeled)
   14.7.3 Paddle wheel interpretation of curl (908)
   14.7.4 Proof of Stokes’ Theorem for polyhedral surfaces (910)
   14.7.6 An important identity (911)

7. The Divergence Theorem
   14.8.2 Divergence Theorem (914)
   14.8.7 Unifying the integral theorems

8. Stokes’ Theorem
   14.7.2 Stokes’ Theorem (906)
   14.4.3 Two forms for Green’s Theorem (880) (tangential form)
   14.4.4 Using Green’s Theorem to evaluate line integrals (882)
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   14.6.4 Moments and masses of thin shells (901)
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