1133-05-193 **Ilkyoo Choi*** (ilkyoochoi@gmail.com), Hankuk University of Foreign Studies, South Korea, and **Louis Esperet**, Laboratoire G-SCOP, CNRS, France. *Improper coloring of graphs on surfaces.*

A graph G is $(d_1, \dots, d_k)$-colorable if its vertex set can be partitioned into k sets $V_1, \dots, V_k$, such that for each $i \in \{1, \dots, k\}$, the subgraph of G induced by V_i has maximum degree at most d_i. The Four Color Theorem states that every planar graph is $(0,0,0,0)$-colorable, and a classical result of Cowen, Cowen, and Woodall shows that every planar graph is $(2,2,2)$-colorable. In this paper, we extend both of these results to graphs on surfaces. Namely, we show that every graph embeddable on a surface of Euler genus $g > 0$ is $(0,0,0,9g-4)$-colorable and $(2,2,9g-4)$-colorable. We also prove that every triangle-free graph that is embeddable on a surface of Euler genus g is $(0,0,O(g))$-colorable. This is an extension of Grötzsch's Theorem, which states that triangle-free planar graphs are $(0,0,0)$-colorable. Finally, we prove that every graph of girth at least 7 that is embeddable on a surface of Euler genus g is $(0, O(\sqrt{g}))$-colorable. All these results are best possible in several ways as the girth condition is sharp, the constant maximum degrees cannot be improved, and the bounds on the maximum degrees depending on g are tight up to a constant multiplicative factor. (Received July 25, 2017)